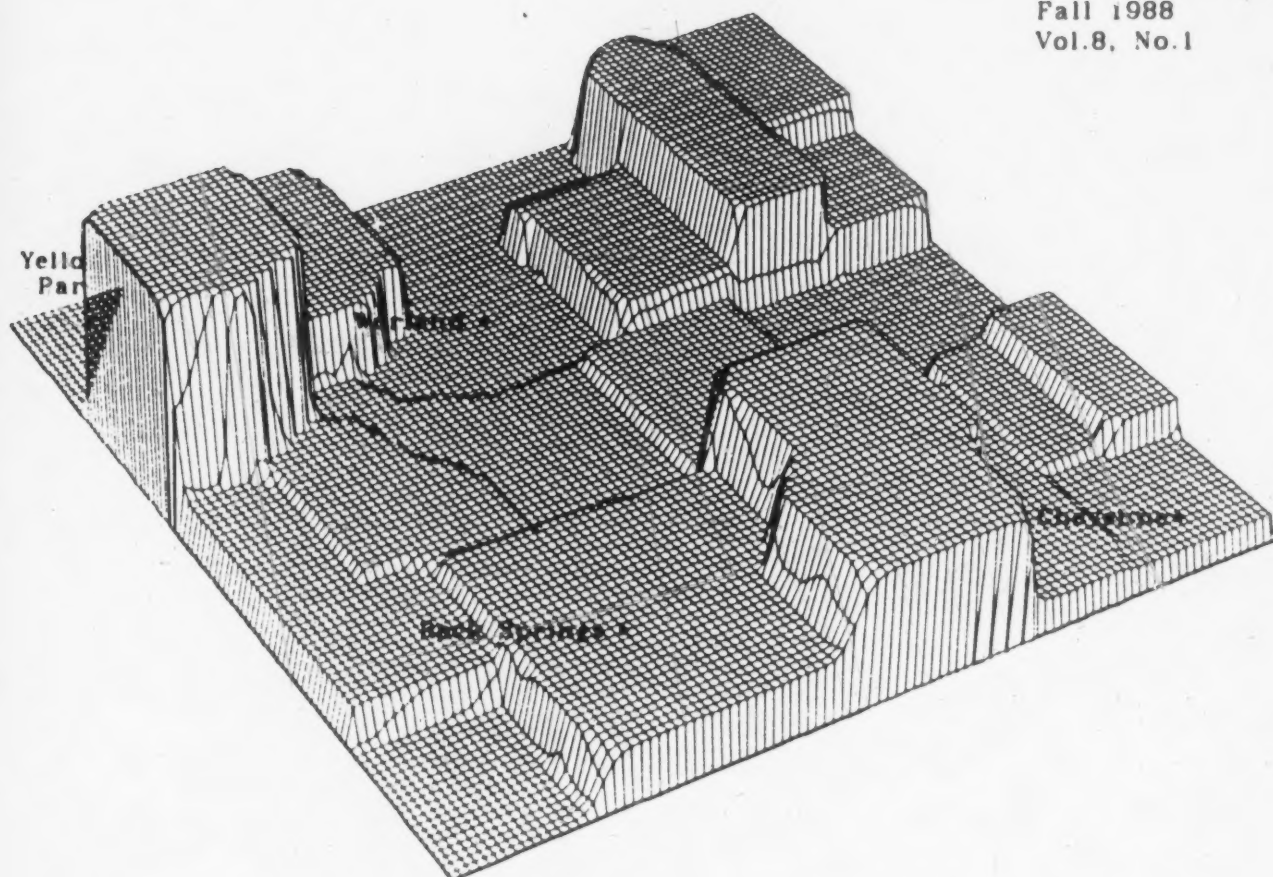


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WYOMING QUARTERLY UPDATE

Fall 1988
Vol.8, No.1



Percent Increase in Sales and Use Tax
Third Quarter 1988 vs Third Quarter 1987



INSTITUTE FOR POLICY RESEARCH
OFFICE OF RESEARCH AND GRADUATE STUDIES
UNIVERSITY OF WYOMING

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Institute for Policy Research (IPR) at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of IPR greatly appreciates the ongoing, cheerful cooperation of each of the data sources listed in the bibliography.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by IPR. Readers are encouraged to contact IPR to find out how to gain access to data which do not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a contour map depicting county increases in revenue from sales and use tax. The map represents the percent of increase in sales and use tax dollars from third quarter 1988 as compared to third quarter 1987. Six counties experienced a percentage loss in tax dollars: Big Horn (-4.91), Converse (-9.72), Hot Springs (-5.50), Niobrara (-5.34), Sheridan (-.75), and Uinta (-.71). These counties are depicted at zero on the contour map.

First-time readers of WQU should refer to the "format" explanations on page 50 for keys on how best to use and interpret data presented in this publication.

For additional information, contact:

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**WYOMING
SCENE**

Fall Minerals Update

OVERVIEW

The production forecasts for 1988 in the table below are pretty firm since it is now the fourth quarter of the year. With this in mind, how have our prognostications changed since January?

In the case of oil, we have increased our January estimate of production to 117 million barrels, which is an increase of six million barrels. Our optimism that oil prices would average \$15.50 in 1988 has not materialized, instead the average price never got much above \$14.00 in the first two quarters, declined through the third quarter, and fell to under \$13.00 at the beginning of the fourth quarter. Since there is little likelihood that oil prices will increase quickly, prices in 1989 most likely will do no more than average what they did in 1988. Barring a long run of very low oil prices (i.e. under \$11.00) which we feel is unlikely, there is a good possibility that 1989 oil production will nearly match 1988 production. Most of this production strength comes from ongoing tertiary and enhanced oil recovery (EOR) projects, a modest number of

discoveries in the Powder River Basin, and some in-fill drilling. Unless we are wrong about prices, a substantial decline in oil production will begin after 1989 and continue until prices do increase, providing that increases do not take too long. Prices under \$15.00 per barrel or just widely fluctuating prices will continue to thwart exploration as well as new tertiary and EOR projects which are needed if the declining production from Wyoming's large, old fields are to be offset.

In the case of natural gas, we have also raised our earlier forecast for methane production. In this case, 1988 production is now estimated at 689.5 billion cubic feet, a 59.5 billion cubic feet increase over what we predicted in January. This increase probably reflects the end of the so called "gas bubble" or oversupply of gas. Consequently, our estimates beyond 1988 have also been increased. While our estimates do not yet include production for a new pipeline from Wyoming to California, the chances of that pipeline being built have certainly not diminished. At least one of the companies competing for the line has already signed up several firm customers and,

Table 1: Wyoming Mineral Production Forecast to 1992¹

Calendar Year	Oil Production ²	Methane Production ³	Carbon Dioxide Production ³	Helium Production ⁴	Coal Production ⁵	Trona Production ⁵	Mined Uranium Production ⁶	In situ Uranium Production ⁷	Sulfur Production ⁸
*1981	122.1	455.4	--	--	102.8	11.8	4.6	--	0.05
*1982	118.7	465.1	--	--	107.9	10.1	2.1	--	0.07
*1983	120.9	539.7	--	--	112.2	10.5	3.0	--	0.57
*1984	127.8	600.1	--	--	130.7	11.0	1.6	--	0.63
*1985	131.0	597.9	--	--	140.4	10.8	0.6	--	0.80
*1986	122.4	563.2	23.8	0.15	136.3	13.3	0.3	--	0.66
*1987	115.9	622.7	110.5	0.84	146.5	13.6	0.2 ⁹	0.06	1.20
1988	117.0	689.5	110.5	0.84	153.0	15.1	0.02	3.0	1.20
1989	116.0	708.4	110.5	0.84	150.0	15.3	0.02	3.0	1.20
1990	110.0	728.0	110.5	0.84	150.0	15.5	0.02	3.0	1.20
1991	103.0	748.1	110.5	0.84	152.0	15.5	0.02	3.0	1.20
1992	96.5	768.9	110.5	0.84	153.0	16.5	0.02	4.0	1.20

* Actual values for comparison

¹ Geological Survey of Wyoming, October, 1988

² millions of barrels

³ billions of cubic feet

⁴ billions of cubic feet, based on Exxon's estimate that the average helium content in the gas processed at Shute Creek is 0.5 percent

⁵ millions of tons

⁶ millions of tons of uranium ore (not yellowcake)

⁷ millions of pounds of yellowcake (U₃O₈), (unknown between 1981-1986 because it was reported only as taxable valuation; estimates for 1987-1991 are based on company information)

⁸ millions of tons, converted from gallons of sulfur produced at gas processing plants as reported to the Wyoming Oil and Gas Conservation Commission

⁹ includes previously stockpiled ore processed by the Lucky Mc mill in 1987

according to members of Wyoming's Pipeline Authority. California users have recognized that they really will need new supplies of gas and maybe much sooner than they originally thought. If built, this pipeline will increase annual forecast production an estimated 100 billion cubic feet by 1991 and an estimated 200 billion cubic feet by 1992.

While we predicted gas prices might turn around in 1988, the only sign of that happening in the third quarter was an increase in the spot sale price at Opal, Wyoming. If prices do not turn around substantially in 1988, they certainly should in 1989.

The increase in the production of carbon dioxide occurred as we forecasted, although the volume for 1988 is now estimated at only 110.5 billion cubic feet, instead of January's estimate of 120 billion cubic feet. Low oil prices certainly do not help here since carbon dioxide is used for EOR projects. Again we predict little increase in CO₂ production, if any, unless oil prices increase enough to stimulate new EOR projects.

Coal is an interesting case as we really underestimated production even for 1987. Production last year was 6.5 million tons above our end-of-the-year prediction of 140 million tons. In January, we were estimating 1988 production at only 143 million tons. By July, we raised our 1988 estimate to 147 million tons. Now at the end of the third quarter, we are raising our estimate for 1988 production to show an all time record of 153 million tons. Beyond 1988, we are estimating that annual coal production from Wyoming will be between 150 million tons and 153 million tons for at least five years. In other words, we are predicting rather flat, but quite substantial, production into the early 1990's.

The prices paid for coal are tracking our predictions with spot coal sales still well under \$4.00/ton in the Powder River Basin. We forecast that the average price paid for Wyoming coal will continue to decline at least through 1992 as more spot sales at low prices in the Powder River Basin offset the higher, long-term contract prices in that basin as well as the higher prices paid for coal in southern Wyoming.

Trona production has provided another pleasant surprise. Back in January, we were showing very little gain in production between 1987 and 1988 or in the years beyond for that matter. Even at the end of the second quarter, the outlook was only slightly better when we showed an expected increase of 400,000 tons over 1987. In the third quarter, an unexpected production upturn has caused us to increase our forecast for 1988 to 15.1 million tons or a 1.5-million-ton increase over 1987. A shortage of caustic soda and some increases in soda ash exports had all the trona producers running their refineries at or very near capacity at the end of the third quarter.

The forecast for uranium is confusing, but good. After the first two quarters, we lowered our estimates for mined uranium to one-tenth of what we predicted in January or to 30,000 tons of ore. At the same time, we estimated yellowcake production from in situ projects at 0.75 million pounds. By the end of the third quarter, however, we lowered our mined-uranium

forecast to 20,000 tons of ore and raised our July estimate of in situ-derived yellowcake from 0.75 million pounds to 3.0 million pounds.

In mid-October, just after the third quarter ended, Japanese officials announced that they would buy 7.5 million pounds of Wyoming yellowcake on a long-term contract with the three remaining active Wyoming producers. Whether or not this changes the annual production forecasts that we have just made remains to be seen as no contract details are yet available. A later newspaper account of the contract even suggests that not all the 7.5 million pounds will come from Wyoming.

Looking at the above comparisons between our previous and present forecasts, many things have improved while others are at least tracking expectations. Oil prices are really the only disappointment as they did not increase or even firm up. Higher than expected production, however, has at least tempered the impact of lower prices in 1988 and may help again in 1989. Predictions of future oil prices still remain a guessing game since they are manipulated by OPEC, and who can predict what OPEC will do tomorrow, let alone a year from now. There is still a good chance, however, that the price of oil will hover between \$14 - \$18 per barrel in the foreseeable future since this nets OPEC relatively good revenues and is still a low enough price to thwart most competition, particularly from domestic producers in the U.S. If the price stabilizes on the high end of the above prognostication, our forecast for oil production from Wyoming may be a little low in the 1990-1992 timeframe. We are confident that our current predictions for oil production are neither overly pessimistic nor overly optimistic given what is going on today.

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OIL AND GAS UPDATE

Many events and circumstances have affected the prices Wyoming receives for its oil and gas production. In the early years a shortage of markets kept prices low. In the 1970s and 1980s, the main controlling factor was the manipulation of production by the Organization of Petroleum Exporting Countries (OPEC). In the 1970s OPEC actions had the effect of raising crude oil prices, which carried through into the early 1980s. In 1986 their actions caused a crash in oil prices. Lack of production restraint by OPEC in 1988 is once again causing oil prices to nose-dive.

The two OPEC orchestrated embargoes in 1973 and 1979, along with price decontrol, led to large price increases for Wyoming oil and gas in the early 1980s. Oil prices peaked at over \$32 a barrel in 1981, but declined at near \$23 a barrel by 1985. This price reduction was mainly caused by increased world-wide production from OPEC, the North Sea, and Mexico. Demand also slowed somewhat because of conservation measures adopted in developed countries.

OPEC once again manipulated prices in 1986. This time they flooded the market with crude oil

to regain their market shares. This maneuver lowered the average price of Wyoming crude oil in 1986 to its lowest point in the 1980s. Oil prices rebounded in 1987 but, once again, began to nose-dive in the second half of 1988 due to the lack of production restraint by OPEC.

When averaged, the posted price for Wyoming Sweet crude oil declined each month of the third quarter in 1988. The average posted price in July was \$14.75 per barrel; for August it was \$14.50; and for September it dropped to \$14.00. In addition, futures for next year dropped to between \$12.50 and \$13.00 per barrel during the first week of October. Posted prices for Wyoming crude oil will go lower if OPEC does not cut its production. Several oil analysts estimate OPEC's current production is at least one million barrels per day above demand. Agreement on a new production limit; however, will be difficult since Iran and Iraq have already stated that they desperately need more revenue to rebuild their war-torn economies.

These lower prices are reflected in the September 1988 rig count which averaged 40, compared to an average of 66 in September of last year. The count dropped to 32 during the last week of September, which was the lowest since early May. The low rig count will also mean fewer well completions than the 1,000 that we predicted at the end of the second quarter. Completions will probably be in the 850 to 900 range.

Natural gas prices also climbed rapidly in the early 1980s. Prices stayed above \$3 per thousand cubic feet (MCF) from 1982 through 1985, and a high level of drilling for natural gas brought about major new gas discoveries which led to an oversupply of that commodity. Prices for Wyoming natural gas responded to the surplus and declined to an average of \$2.52 per MCF in 1986 and to an average of \$1.76 in 1987. Natural gas prices have not yet recovered and are not projected to begin increasing until late 1988 or early 1989 when supply and demand should begin to balance. In support of this forecast, the spot gas price at Opal, Wyoming increased this September. In past years, the spot price has either stayed steady or decreased in September. It may be a little early to say that the gas surplus has ended, but it appears that Wyoming gas producers will see increased demand and slightly higher prices for their natural gas in 1989.

Also, natural gas production in Wyoming for 1988 is forecasted at 800 billion cubic feet, which would be a nine percent increase over 1987 production. The 800 billion cubic feet includes an estimated 110.5 billion cubic feet of carbon dioxide produced at Exxon's Shute Creek plant.

Lease sales continue to do well in Wyoming despite low oil prices. The high per-acre bid at the August U.S. Bureau of Land Management (BLM) sale was \$1,350 by Marathon Oil for a 428.61-acre parcel in the Powder River Basin, covering parts of sections 8 and 19, T.36N., R.75W. The parcel is about a mile and a half from production at Sand Dunes Field and is about 3 miles east of Blizzard Field.

The top bid of \$375 per acre at the Wyoming Department of Public Land's July sale was made by Anna Wells for a 39.7-acre lease in section 6, T.49N., R.71W. The tract, also in the Powder

River Basin, is a mile southwest of AG Farm Field, a Minnelusa field discovered in 1986 which has produced over 300,000 barrels of oil. Twenty-one leases in this sale received bids of \$100 or more, and the sale generated more revenue than any sale since March of 1985.

The high per-acre bid at the Wyoming Department of Public Land's September sale was \$180 by Decalta International and went for a 320-acre tract in the Powder River Basin in section 36, T.49N., R.71W. The lease is near Minnelusa production at Rainbow Ranch and Timber Creek South Fields.

Production statistics for 1987 from the Wyoming Oil and Gas Conservation Commission are now final and show oil production was 115,922,003 barrels and natural gas production was 733,210,238 MCF. Once again the top 25 oil fields and the top 25 gas fields accounted for the majority of the production. The top 25 oil fields produced 55 percent of Wyoming's oil and the top 25 gas fields produced 76 percent of Wyoming's natural gas. Sixteen of the top 25 gas fields were discovered after 1970. These fields accounted for 59 percent of Wyoming's 1987 natural gas production. Only eight of the top 25 oil fields were discovered after 1970, and these accounted for 17 percent of Wyoming's oil production.

Based on company data and on information compiled and published by Petroleum Information, the following significant exploration and development events occurred in Wyoming during the third quarter of 1988.

A. Exxon Corporation recently completed the westernmost producing well in Luckey Ditch Field. Exxon has not disclosed test results on the 1 Sage Creek-Federal well in section 13, T.12N., R.115W.; however, the well is producing from the Dakota and is a mile west of the nearest producing well in the field.

B. General Atlantic Energy tested their 1-15 UPRR wildcat in section 15, T.22N., R.111W. The well flowed 423 barrels of oil, 690,000 cubic feet of gas, and 298 barrels of water per day from the Dakota. The nearest Dakota production is nearly 12 miles north in Lincoln Road Field.

C. Amoco Production announced plans to drill a 9,500-foot test of the Phosphoria, Tensleep, and Madison in section 29, T.44N., R.112W. The well will be drilled on the flank of Spread Creek anticline nearly seven miles north of Sohare Field, a shut-in discovery drilled by Exxon in 1981.

D. Four stratigraphic tests will be drilled to identify the formations under the volcaniclastic rocks in the Absaroka Range. Conoco will drill the tests in sections 6 and 17, T.43N., R.102W. and in section 13, T.43N., R.103W.

E. Global Natural Resources will drill a wildcat to test the Sundance, Nugget, and Tensleep. The well, in section 20, T.22N., R.88W., is about eight miles south of the nearest production at Bell Springs Field.

F. Tenneco Oil's offset to the Austin Creek discovery flowed 730 barrels of oil and 625,000 cubic feet of gas per day on a production test. The 1-7 Schloegel-Federal in section 7, T.32N., R.84W. is just north of the discovery well, which was completed flowing 288

barrels of oil and 392,000 cubic feet of gas per day from the Muddy Sandstone.

G. Amoco Production staked two locations for Muddy Sandstone tests in Sheridan County. The locations in section 36, T.55N., R.80W. and in section 8, T.54N., R.80W. are over 10 miles from abandoned Muddy production at Amp Field.

H. Lario Oil and Gas discovered oil in the Muddy Sandstone at their 1-Ute-Federal in section 15, T.57N., R.72W. Pipe recovery from a drillstem test was 2,256 feet of oil.

I. A wildcat drilled by Union Pacific Resources was completed in the Minnelusa Formation pumping 255 barrels of 21° API gravity oil daily. The 1 WECO-UPRC-Sawgrass-Federal in section 32, T.57N., R.70W. is a little over a mile from 85 Creek Field, a Minnelusa discovery drilled in 1986.

J. Maxim Drilling and Exploration completed a discovery near Wallace South Field pumping 82 barrels of 23° API gravity oil and two barrels of water a day from the Minnelusa Formation.

K. The 14-4 Geis well drilled by Coastal Oil and Gas in section 4, T.47N., R.73W. found oil in the Parkman Sandstone member of the Mesaverde Formation. The well was completed for an initial potential of 130 barrels of oil a day on pump, but it is currently producing 55 barrels of oil per day.

L. Maxus Exploration completed a Dakota gas discovery in section 6, T.41N., R.72W. flowing 417,000 cubic feet of gas daily. The 32-6 Mongoose Unit is about six miles from the nearest Dakota production at Mary Draw and Turnercrest Fields.

M. Chevron USA completed a Frontier oil and gas discovery in section 10, T.36N., R.76W. The 1-10 Blue Hill-Federal pumped 139 barrels of 40° API gravity oil, 135,000 cubic feet of gas, and six barrels of water a day. Sand Dunes Field, which is two miles away, also produces from the Frontier Formation.

N. A wildcat well, the 1 Berger, was drilled in section 17, T.53N., R.67W. by EMC Energies, Inc. It was completed in the Minnelusa flowing 700 barrels of 22° API gravity oil per day. The well is a half mile from the Minnelusa production at Deadman Creek Field, but it is separated from that field by dry holes.

O. Dabros Properties recovered oil on a drillstem test of the Minnelusa at the 24X-8 Hundahl well drilled in section 8, T.53N., R.67W. The well is a mile from the Deadman Creek Field and a mile from the 1 Berger discovery described in the paragraph above.

P. Maxim Drilling and Exploration completed their 33-13 Brislawn well in section 13, T.54N., R.68W. pumping 220 barrels of 24° API gravity oil and 250 barrels of water per day. The Minnelusa discovery is about one mile from the nearest Minnelusa production at Lad Field.

In other petroleum-related matters, the State recently refunded \$1.1 million in sales taxes to Chevron USA because of overcharges by Utah Power and Light for electrical power at Chevron's Painter Reservoir gas plant in Uinta County from November of 1983 through October of 1986. Half of the refund will come from Uinta County and towns within Uinta County; the other half will come from the State's general fund.

The Sierra Club's Legal Defense Fund filed a protest on behalf of the Sierra Club and the National Wildlife Federation against a BLM oil and gas lease sale in Colorado. The protest is in response to the Ninth Circuit Court ruling in the case of *Conner vs. Burford* which held that government analysis of an offered lease tract must contain enough information for the public to predict what will happen if full field development occurs. A case decided by the Tenth Circuit Court reached an opposite conclusion from the *Conner vs. Burford* decision, so it may take a higher court to resolve the conflict. The Sierra Club has apparently decided not to pursue legal challenges to future lease sales in Wyoming at least for the time being.

*Rodney H. De Bruin
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COAL UPDATE

Wyoming coal production for 1988 appears headed for an all-time record according to mid-year production indicators. Coal deliveries for the first half of 1988 are nearly seven million tons more than deliveries made for the first half of 1987. If second half deliveries in 1988 are equal to deliveries during the same period a year ago and if unreported tonnage is the same as in 1987, coal production for 1988 could reach 153.3 million tons. Increased sales of spot and contract coal were noted by many of the State's coal mines this year as hot, dry weather maintained the demand for coal-fired electricity (for air conditioning and to replace hydro-electric power), especially in the West and Midwest.

Coal production and consumption are also up nationally. The National Coal Association revised its coal forecasts for the United States in July, predicting that national coal production would reach a record 926 million tons in 1988, a nine million ton increase over 1987's record, and that coal consumption (plus exports) would reach 932 million tons, a 15-million-ton increase from 1987. While coal production in the western U.S. was forecasted at 348 million tons, an increase of 11 million tons from 1988, Eastern production was forecasted at two million tons less than in 1987. Coal consumption by electric utilities was predicted to account for nearly all of the increase: a record 733 million tons of utility coal will be consumed in 1988, compared with 718 million tons in 1987.

Wyoming coal production will probably drop slightly in 1989 (after peaking in 1988) as coal demand stabilizes slightly in response to more normal coal-usage by electric-generating plants. Coal production should reach or exceed 150 million tons each of the next four years, possibly showing slight increases in 1991 and 1992 as new coal supply contracts are signed and expiring contracts are renewed.

The average assessed value of Wyoming coal, for tax purposes, is expected to continue downward through 1992. Although the annual rate of decrease will be progressively less each year until 1992, valuation will continue to fall as most contracts are renegotiated or bought out at

lower prices, as spot and short-term sales continue at prices substantially less than contract, and as the keen competition for coal sales in a buyers' market continues. In addition, valuation increases noted in some areas of the State will be offset by increased production of lower valued coal elsewhere. In 1992, after the average valuation of coal reaches lows of \$5.53 per ton, \$15.94 per ton, and \$6.91 per ton, which are the averages for low cost, high cost, and "all" produced coal, respectively, valuation will begin to gradually increase as market conditions improve and coal prices rebound.

The availability of large quantities of low-priced, easily accessible coal in the Powder River Basin of Montana and Wyoming is evidently causing many utility companies and other coal buyers that have not traditionally purchased fuel from this basin to investigate how they can utilize the coal at their facilities. For example, Consumers Power Company in Michigan is buying coal from Thunder Basin Coal Company to blend with higher Btu coal from the Appalachian area in an effort to meet that State's clean air regulations. (See Powder River Basin developments, below, for contract details.) Eastern coal has traditionally served this area with both contract and spot sales of 12,000+ Btu/pound coal so this sale of western coal represents a potential new market that could displace up to 1.2 million tons of eastern coal annually.

This summer, Otter Tail Power Company, operator of lignite-burning power plants in South Dakota, North Dakota, and Minnesota, tested subbituminous coal from the Rochelle mine at the Big Stone power plant in South Dakota. The utility company later announced that 50,000 tons of coal from Nerco Coal's Spring Creek mine in Montana would be tested at the Hoot Lake power plant in Minnesota and that bids were out for 125,000 to 150,000 tons of coal to be tested at the Big Stone plant. Both power plants currently burn North Dakota lignite under long-term coal supply contracts. Evidently, both the coal supply contracts and the transportation contracts are near reopener clauses or expiration dates and Otter Tail is investigating alternatives that may result in cheaper fuel and transportation costs. If Otter Tail does indeed decide to purchase subbituminous coal instead of lignite, two to 2.5 million tons per year of lignite could be displaced by 1.5 to 1.75 million tons per year of Powder River Basin coal.

Coal from the Montana portion of the Powder River Basin is also making inroads into the export markets. A Canadian utility company, Ontario Hydro, recently purchased 150,000 tons of coal from Nerco Coal's Spring Creek mine. The utility cited several factors for purchasing U.S. coal, including the need for low sulfur coal to meet sulfur dioxide emission requirements, the rising prices of western Canadian coal, and an increase in coal consumption related to electricity demand. In late July, it was announced that 24,000 tons of coal from Nerco Coal's Spring Creek mine would be exported to Japan for testing by a Japanese utility company. As was the case in the earlier

sale of Wyoming coal to Taiwan. Burlington Northern Railroad (BN) played a key role (including significant price reductions on transportation) in the sale. Besides BN and Nerco, Inc., Mitsubishi Corporation of Japan and Westar Mining Ltd. of Canada were involved in the sale. BN transported the coal to Canada's Westshore Terminal at Roberts Bank (near Vancouver, B.C.) where about half the coal was blended 50-50 with Canadian coal from Westar Mining and loaded directly on ships bound for Japan. It is hoped that this sale, along with the previous sale to Taiwan, will encourage future exports of Powder River Basin coal.

In coal transportation news, Chicago and North Western Transportation Company (C&NW) and the Lower Colorado River Authority (LCRA) announced in August that they had signed a new long-term coal transportation contract and that legal action taken by LCRA and the City of Austin, Texas, against C&NW had been dismissed. The long-term contract (duration unknown) is for transportation of coal from mines in southern Campbell County and northern Converse County (southern part of the "Gillette strip") to the Fayette Power Project near Halstead, Texas. The new contract replaces a one-year contract that expires on April 1, 1989. The agreement also gives LCRA and the City of Austin trackage rights to a rail line that Union Pacific Railroad Company (UP) will own after they acquire the Missouri-Kansas-Texas Railroad Company (MKT) later this year (McGraw-Hill, 1988). This will give LCRA a choice of rail carriers into the Fayette Power Project and end LCRA's planned development of its own rail line to the project.

Another part of the C&NW - LCRA/City of Austin agreement dismissed C&NW as a defendant in a lawsuit that LCRA, other utility companies, and Energy Transportation Systems, Inc. (ETSI) had filed against several railroad companies. The lawsuit alleges that the railroad companies conspired to violate federal antitrust laws in preventing ETSI from building a coal slurry pipeline from Wyoming to Arkansas. Part of the settlement involves \$9 million in cash payments by C&NW to Houston Lighting and Power (Copper Queen Publishing Company, Inc., 1988).

Developments in western and southwestern Wyoming

In late September, Bitter Creek Resources began coal production at the Stansbury underground mine north of Rock Springs, thus becoming Wyoming's newest mine and the third underground coal mine in the State. The mine last operated between 1976 and 1981 as a joint venture between Rocky Mountain Energy Company (now Union Pacific Resources) and Ideal Basic Industries. Earlier this year, Bitter Creek Resources, which purchased the mine in 1986, received a development loan guarantee of \$950,000. The first coal was shipped by truck to an unidentified industrial user in the area on September 21 and initial production of 20,000 tons per month is expected. The mine produces a high-Btu bituminous coal and employs 20 workers. Bitter Creek is currently negotiating with several other potential customers in the West and if additional contracts

are procured, production could increase to 40,000 tons per month and additional miners could be hired.

A new coal market for Wyoming and Utah may be developing in the next few years as plans for a large coal-fired electrical generating project in northern Nevada was announced in September by Sierra Pacific Resources (SPR). SPR is one of eight participants in the project. The proposed \$4 billion Thousand Springs Power Project would consist of eight 250-megawatt generating units located several miles north of Wells, Nevada. Each unit would cost about \$450 million to construct and would require 700,000 to 800,000 tons of coal annually. Although two western coal mining companies, Coastal States Energy Company (of Utah) and Pittsburg and Midway Coal Mining Company (of Colorado) are equity participants in the project, SPR announced that coal supplies for the project would be procured competitively from a variety of sources most likely located in Wyoming and Utah. Construction of the first unit would probably begin in 1991, although no power supply contracts or coal supply contract have been signed yet. The power generated from this project would be marketed wholesale to utility customers most likely located on the West Coast and in the southwestern United States. The Kemmerer mine in Lincoln County (operated by Pittsburg and Midway Coal Mining Company) would certainly be a possible source for some of the coal as would the Black Butte coal mine east of Rock Springs. Black Butte Coal Company currently delivers coal to Sierra Pacific Power Company's North Valmy power plant in Nevada. If competitive rail transportation rates can be obtained, even coal from the Hanna Basin or the Powder River Basin could be available for the project.

Developments in the Hanna Basin

Third quarter developments in this area are mostly discouraging as additional layoffs have occurred and no significant new coal contracts have been announced. Rosebud Coal Sales Company announced in September that an unspecified number of the 65 employees at the Rosebud mine near Hanna could be laid off near the end of 1988. Rosebud's 15-year 500,000 ton-per-year contract with Iowa Public Service Company (IPS) is expected to end in December 1988. The utility company has been accepting accelerated shipments from Rosebud during the year and plans to complete the tonnage requirements on the contract in December, one year earlier than planned. The contract is Rosebud's only major contract and the loss of it may force the mine to enter a reclamation phase in anticipation of permanent closure.

Another IPS contract with a Hanna Basin coal producer was due for price reopening negotiations in July, 1988, but it is not known whether or not IPS exercised this option. Energy Development Company (owned by parent company Arch Mineral Corporation) has a 10-year, 360,000 ton-per-year contract with IPS that is due to expire in 1993. The coal for this contract is mined at Arch of Wyoming's Seminoe 2 mine. Meanwhile, IPS is ordering spot coal from the Powder River Basin for test burns at the George Neal No. 3 plant in anticipation of

purchasing lower priced coal after the Hanna Basin contracts are completed. IPS is also planning a test of Amax Coal Company's dried coal product from the Belle Ayr mine when it becomes available in late 1988 or early 1989. The dried coal has a heating value of about 10,800 Btu/pound, about the same as many of the Hanna Basin coals. It is anticipated that many utility companies, which currently use higher heat value coals, may want to test this dried coal product because the dried product will not require derating a generating unit's boiler system as is the case when a lower heat value coal is used.

Arch of Wyoming announced in late September that 50 employees at their Seminoe 2 mine at Hanna had been laid off. The company employed 79 workers and operated two draglines at Seminoe 2 before the layoffs; production was scaled down accordingly and one dragline was idled after the layoffs. Arch of Wyoming also operates the Medicine Bow mine northwest of Hanna and evidently the increased productivity at this mine has created a stockpile of coal that can be used to fill existing contracts and spot sales. The Medicine Bow mine reopened early in 1988 after being on standby status the year before. That mine has 23 employees. Arch has a three-year coal supply contract with Kansas Power and Light Company which expires in March, 1989, and has also made several spot sales to the same company, including an 80,000-ton sale for the fourth quarter of 1988.

Developments in the Powder River Basin

In response to an increased demand for coal, Nerco Coal Company has applied to the State of Wyoming's Industrial Siting Council to expand the capacity of its Antelope mine to seven million tons by 1993. The original siting permit for the mine in 1981 was for 12 million tons a year, but the permit was downsized to one million tons shortly afterwards because contracts had not been signed for that much coal. The permit was amended again to allow production of three million tons per year, but the prospects for additional coal contracts by 1993 have prompted Nerco to increase the mine's capacity.

Two "clean coal technology" projects involving Powder River Basin coal were recently denied federal funds by the U.S. Department of Energy. Char-Fuels of Wyoming, Incorporated and Energy Brothers Technology, Incorporated were notified in late September that their bids for \$54 million and \$40 million, respectively, in federal funds had been rejected. The \$537 million in federal funds available for the Clean Coal Technology Program were awarded to 16 proposals for retrofitting existing power plants. None of the final 16 projects were located in the western United States. The Char-Fuels project will probably be delayed because \$15.5 million of the expected federal funds were to be used to match the \$16.5 million in guaranteed loans provided by the State of Wyoming. Char-Fuels is now attempting to secure private funds to qualify for those funds authorized by the State. The Energy Brothers K-Fuels project reportedly will not be affected by the denial of federal funds.

In August, the first K-Fuel pellets were produced in a pilot plant east of Gillette. The 2,000 ton-per-year plant is intended to aid Energy Brothers in development of a 350,000 ton-per-year commercial plant. By 1992, the company hopes to have three K-Fuel plants producing 1.4 million tons of 12,500 Btu/pound K-Fuel. Wisconsin Power and Light Company has contracted to purchase one million tons of K-Fuel per year for three power plants. In turn, Fort Union Coal Company will provide two million tons of coal per year to the K-Fuel plant for this contract. The State of Wyoming has loaned \$11.7 million to Energy Brothers Technology, Inc. for development of the project.

Disputes over coal contracts between Powder River Basin coal producers and utility companies are worth noting this quarter, mainly because the lawsuits usually either result in new contract with other mines, cash settlements, or extensively revised or renegotiated contract terms. Western Fuels Association and two of its member utilities, Sunflower Electric Cooperative and Basin Electric Cooperative filed a lawsuit against Mobil Coal Producing, Incorporated in July. The utilities are seeking to cancel their contracts with Mobil and recover alleged overcharges made by Mobil. Coal deliveries from Mobil's Caballo Rojo mine to Sunflower Electric Cooperative's Holcomb, Kansas, generating plant were halted and spot coal from Carter Mining Company was used in its place. In September, Sunflower Electric announced that 400,000 tons of coal from Elk River Resources' (Cordero Mining Company) Cordero mine would be used at Holcomb for the rest of 1988. Coal deliveries from Mobil to Basin Electric Cooperative's Laramie River plant near Wheatland continued despite the legal action. In September, Mobil files a countersuit against Western Fuels and the two electric cooperatives. In another matter, Western Fuels continues to pursue an equity partnership arrangement with a Wyoming coal producer to open a new mine in the Powder River Basin.

Another lawsuit and counter-suit involves Triton Coal Company's Buckskin mine and Cajun Electric Power, operator of the Big Cajun generating plant in Louisiana. This contract dispute also involves coal prices. Deliveries to Cajun continue despite the lawsuits under a "bridge agreement" that is in effect until the lawsuits are resolved. [This litigation was apparently settled in favor of Triton early in October].

Finally, Portland General Electric (PGE) and Amax, Incorporated have filed lawsuits and counter-suits over a take-or-pay coal supply contract for PGE's Boardman, Oregon, generating plant. The Boardman plant has been inactive since 1984, but PGE's contract with Amax specifies a minimum tonnage of 1.2 million tons per year. Because PGE won't accept the coal, Amax is paid for the coal even if no deliveries to the plant occur. At issue is the price that Amax charges PGE for the coal and how the price is determined. PGE is asking for repayment of the entire \$17.7 million it has paid to Amax since 1983 and Amax is asking for \$14.6 million from PGE for coal that the utility was obligated to buy.

During the third quarter, coal contract activity involving Powder River Basin mines was rather brisk. A summary of new or renegotiated coal contracts follows:

1) Two small Wyoming coal users have opted to buy from out-of-state coal producers. The Holly Sugar Company's sugar beet processing plant at Torrington is purchasing 20,000 tons of coal from Kerr Coal Company at Walden, Colorado, for this season's activity. The Veterans Administration Medical Center in Sheridan is buying 5,650 tons of coal from Nerco Coal's Spring Creek, Montana, mine through Schultz Coal Sales, Incorporated, a coal broker in Sheridan. The latter coal will be oil treated and is priced at \$19.75 per ton delivered by truck.

2) Wisconsin Electric Power Company signed a four-year, two million ton-per-year coal supply contract with Mobil Coal Producing, Inc. Coal from the Caballo Rojo mine will go to the utility's Pleasant Prairie plant via Western Railroad Properties, Inc. (WRPI) and C&NW rail lines. Deliveries will begin in January, 1989 and will be completed in December, 1992. This utility company is also renegotiating their contract with Carter Mining Company's Caballo mine for deliveries to the same plant.

3) Northern Indiana Public Service Company (NIPSCO) has signed a six month contract with Amax Coal Company for an unspecified amount of spot coal from the Bell Ayr mine. The coal will be used at various NIPSCO power plants in Indiana.

4) Consumers Power Company has awarded a 250,000-ton spot coal contract to Thunder Basin Coal Company's Black Thunder mine for test burns at two Michigan generating plants. The Cobb plant at Muskegon, Michigan, will use 50,000 tons of coal; deliveries started in mid-July. This coal will be transported to Chicago by Burlington Northern Railroad (BN) and barged across Lake Michigan to the plant. The Campbell plant at West Olive, Michigan, will test 200,000 tons of coal with deliveries starting in September. This coal will also be transported to Chicago by BN; CSX railroad will make final delivery to the plant.

5) Carter Mining Company and the Lower Colorado River Authority (LCRA) signed a six-month agreement for 600,000 tons of spot coal for the Fayette No. 3 plant in Texas. Coal from the Rawhide mine will be shipped from August through January via C&NW and UP on existing transportation contracts. Price of the coal was \$3.85 a ton, F.O.B. the mine.

6) Peabody Holding Company (owner of subsidiary Rochelle Coal Company) was awarded a 1.27-million-ton spot coal contract to supply LCRA's Fayette No. 1 and No. 2 generating plants in Texas. The six-month agreement will start on October 1 and will use coal from the Rochelle mine. Although Thunder Basin Coal Company's bid of 126 cents/million Btu delivered (\$3.72 per ton F.O.B. Coal Creek mine for 8,400 Btu/pound coal) and Carter Mining Company's bid of 127.3 cents/million Btu delivered (\$4.00 per ton F.O.B. Caballo mine for 8,425 Btu/pound coal) were both lower than Rochelle's bid of 128.7 cents/million Btu delivered (\$5.04 per ton F.O.B. the mine for 8,775 Btu/pound coal),

Rochelle won the contract apparently because they asked for fewer exceptions to the solicitation during the contract negotiations.

7) Platte River Power Authority (PRPA) agreed to buy 50,000 tons of coal from Thunder Basin Coal Company in late August. The coal mined at Coal Creek, was used for a test burn at the Rawhide Energy Station near Fort Collins, Colorado. Evidently, the 28,000 tons used for testing prior to October was enough for PRPA to discover the coal caused a problem with their scrubbers so the remaining coal deliveries were cancelled. The utility's 25-year contract with Nerco Coal Company's Antelope mine continues as before. PRPA's contract with Nerco allows solicitation of competitive bids on an annual basis.

8) Kansas City Municipal Utilities and Carter Mining Company signed an agreement for 200,000 tons of spot coal for the rest of 1988. The coal will be mined at the Caballo mine, which already has a contract for 700,000 tons per year with the utility.

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INDUSTRIAL MINERALS UPDATE

Aggregate

Aggregate is the sized rock material mixed with cement or asphalt to form concrete or other construction material. Decorative aggregate is used for its appearance as well as for its suitability for construction aggregate. Colored precast concrete composed of colored cement with decorative aggregate, is commonly used for major buildings, highway overpasses, and other structures throughout the world. There is a developing interest in decorative aggregate in Wyoming for precast concrete, landscape rock, floor tile, and other uses. Through the assistance of the Geological Survey of Wyoming, several types of colors of rock from Wyoming are currently being tested. Several tons of decorative aggregate from Wyoming were sent to Hays, Kansas, in September, 1988. This rock was half-inch sized red granite from the Rawhide Buttes area south of Lusk. It will be used in precast concrete.

Highway construction projects in Wyoming use aggregate for road surfacing material. The most often used rock type is limestone. Granite, clinker (baked and fused rock), and "river rock" (aggregate from natural gravel deposits) are also used. During the third quarter of 1988, the production of aggregate in

Wyoming not only increased over the preceding quarter, but also surpassed the same quarter of last year. Except for the seasonal slowdown during the winter months, aggregate production in Wyoming should continue to increase in 1989.

A legal decision also affected aggregate deposits this quarter. The Wyoming Supreme Court ruled that when a property is sold without selling the mineral rights, gravel is not considered a mineral and is not the property of the mineral owner. A mineral as ruled by the Supreme Court must have characteristics or properties that give the substance a special value. Property owners who do not own the mineral rights can sell gravel for construction without involving the mineral rights owner. Decorative aggregate, however, has been found to have a special value, and may be considered a mineral.

Bentonite

Wyoming's bentonite industry continues to produce far below capacity. No increase in production is projected since domestic oil and gas well drilling has remained low. Bentonite is primarily used in drilling mud. Other uses for bentonite, such as foundry castings, taconite pelletizing, and as a filler in cosmetics, have increased consumption a little.

Cement

Mountain Cement Company in Laramie is Wyoming's only cement producer. Mountain Cement uses limestone, marl (shale), gypsum, and small amounts of silica sandstone and iron oxide to make cement. A recent \$20 million renovation of its plant is almost completed. About 100 people will be employed at the plant when full production is reached. The construction of a new airport at Denver will require large quantities of cement, and Mountain Cement is hopeful that it will be able to supply some of that demand.

Gypsum

Gypsum is quarried in Wyoming at three locations. The two plants in the Bighorn Basin use gypsum to produce wallboard (drywall). The gypsum from the Laramie area is used to make cement. Gypsum production in Wyoming has been slowly increasing as the demand for wallboard increases. The completion of Mountain Cement's renovation (see preceding section) will also cause Wyoming's gypsum production to increase.

Limestone

Limestone is quarried, crushed, and sized in Wyoming for use in highway construction projects, cement, and for power rock. An old quarry near Hartville, in Platte County was reopened and is being used as the source of highway aggregate in eastern Wyoming and western Nebraska. Another quarry, six miles north of Hartville, was opened in the third quarter to supply power rock (for burn control and emissions control) to the Laramie River power plant near Wheatland. Limestone used in the refining of sugar beets in Wyoming and western Nebraska continues to be supplied from South Dakota and Montana. Limestone for the production of cement

at Laramie comes from quarries three miles east of the plant.

Phosphate

The production of phosphate fertilizer at Chevron's plant near Rock Springs continues at high rates due to a sustained demand for phosphate products. Phosphate is mined in Utah and shipped to the plant by slurry pipeline. Sulfur from Wyoming (see section on Sulfur) is used in the process. A plant expansion announced earlier this year is in progress. Increased production from this plant has contributed to the reduction in production of phosphate in Idaho, and the closure of several plants there. The Smoky Canyon phosphate mine, three miles west of the Idaho-Wyoming border near Afton, Wyoming, may also close soon.

Silica

Silica deposits in Wyoming continue to attract attention. The Geological Survey of Wyoming has assisted in providing geologic information to some companies interested in constructing a glass plant or plants in Wyoming. The proposed plants will produce glass using Wyoming silica and soda ash (see section on Trona). Two silica deposits, one near Laramie and one near Glendo, are being considered.

Sulfur

So far, U.S. sulfur production in 1988 is out pacing production in 1987 according to figures released by the U.S. Bureau of Mines. Currently, all the sulfur produced in Wyoming is a by-product of natural gas and petroleum processing. The Wyoming Economic Development and Stabilization Board, however, has awarded a grant to the City of Thermopolis to conduct surface studies on a deposit of mineral sulfur owned by the Wyoming Sulfur Corporation. The deposit is located three miles west of Thermopolis. This study is being conducted by a Canadian engineering firm.

Trona

In 1988, the brightest aspect of the industrial mineral industry in Wyoming is the increase in trona production. A combination of factors, including a shortage of caustic soda (NaOH) for which soda ash (refined trona) may be used, has caused this increased demand and resulting production. Caustic soda is produced by reacting quicklime (CaO) with hydrous sodium carbonate. Soda ash may be used instead of synthetic sodium carbonate. Exports of soda ash have also increased. These factors have revitalized the Wyoming trona mining and refining industry. Wyoming produces almost 95 percent of all domestic soda ash. The five soda ash refineries near Green River were operating at about 80 percent of their full capacity at the beginning of the year, but have now increased production to their full capacity of 35,560 tons of trona are now processed each day. While this boom in the trona patch is good news for Wyoming, industry officials are not predicting a lasting boom yet.

One official, Roger Harris of Tg Soda Ash Inc., says the boom is dependent on the substitution of trona for caustic soda. If this use continues, the boom will continue. Otherwise, the production of soda ash will slip back to 1987 levels. Most industry officials are saying that the plants will be running near full capacity for at least a year.

FMS Corporation, one of the five trona refiners, announced it will construct a 60-million-pound-per-year sodium cyanide plant at the site of FMC's soda ash plant west of Green River. Sodium cyanide is used in the extraction of gold from its ore. New gold mines and mills in Nevada, California, and elsewhere have increased the demand for sodium cyanide, convincing FMC of the viability of constructing a new plant. Trona is the sodium raw material used in the production of sodium cyanide. Methane from natural gas is another raw material available from Wyoming which is used in the production of sodium cyanide.

Bonneville Transloaders, Inc. (BTI), a Riverton, Wyoming, trucking firm that hauls soda ash from Green River to the Burlington Northern Railroad (BN) at Bonneville, Wyoming, near Shoshoni, has offered to purchase the railroad line from Shoshoni to Riverton from the Chicago and North Western Railway (C&NW). BTI is primarily interested in changing its loading facility from Bonneville to Shoshoni, saving a much longer truck haul between these two locations. The use of the remainder of the 27-mile-long segment of track formerly operated by C&NW is uncertain. Several industries in Riverton will be without rail service if this line is abandoned. Most soda ash from Green River is shipped on the Union Pacific Railroad, which has rail spurs to all of the soda ash refineries. However, BN ships some soda ash to consumers through its system. This soda ash is hauled by BTI.

Uranium

In the third quarter of 1988, uranium oxide production from the Pathfinder (COGEMA) mill in the Shirley Basin decreased while production from both Everest Minerals' Highland *in situ* mine and Malapai Resources' Irigary and Christiansen Ranch *in situ* properties in the Powder River Basin increased.

The U.S.-Canada free trade agreement and other import-related issues continue to cloud the future of uranium production in the U.S. as well as Wyoming. However, the production costs of the two *in situ* operations in Wyoming may be very similar to the production costs of uranium mined in Canada.

The uranium industry in Wyoming has asked for help from the State of Wyoming through a reduction of severance tax rates from the current 5.5 percent to two percent. This relief would lower the cost of doing business in Wyoming, according to officials of Pathfinder Mines Company.

Other forms of relief for the ailing domestic uranium industry included a bill passed by the U.S. Senate that contained a provision sponsored by Wyoming Senators Simpson and Wallop which provided a \$750 million uranium procurement program--\$80 million of which was to be

purchased from small uranium producers. One billion dollars was also provided to cleanup old uranium mill tailing sites, nine of which are in Wyoming. This bill was passed by the Senate, but was defeated in the House. Wyoming Representative Dick Cheney had introduced a similar bill in the U.S. House of Representatives to buy domestic uranium and provide money for a cleanup of mill tailings. The Senate-passed legislation was the result of a House-Senate compromise between the two bills.

On a related note, the U.S. Nuclear Regulatory Commission (NRC) revoked the license of a Utah company operating a depleted-uranium processing plant in Evanston, Wyoming. Depleted uranium is the material remaining after the process in which natural uranium, containing about 0.3 percent of the fissionable isotope U-235, is enriched to three percent U-235 for use in nuclear power plants. Depleted uranium is used in uranium chemicals, armor piercing shells, armor, and weights. The license of the Evanston plant was revoked due to alleged violations of their permit.

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METALS AND PRECIOUS STONES UPDATE

Several companies continue to investigate low-grade, large-tonnage, epithermal gold and rare earth deposits in Tertiary igneous rocks in the Black Hills of Wyoming. Much of the activity is in the Bull Hill and Ogden Creek areas, where disseminated gold is associated with anomalous rare earth and manganese concentrations in altered trachyte (Hausel and Sutherland, 1988). According to the 1988 Summer quarterly report of the Narrow Gage Scout, International Curator Resources Ltd. has recently joined in the exploration for gold in this region.

South of the Bear Lodge Mountains, the little known Hurricane district, which produced a small amount of lead, zinc, and silver during the 1940s, was briefly examined by the Geological Survey of Wyoming. This district is located in Black Buttes, a heavily vegetated group of low-lying hills six miles south of Sundance, Wyoming. One prospect examined by Survey staff consisted of Tertiary trachyte intruding brecciated Mississippian Pahasapa limestone. The breccia is cemented by galena and contains many cavities filled with hemimorphite. Minor fluorite and wulfenite are also present. Wulfenite was confirmed by x-ray diffraction, and this is believed to be the first report of the lead-molybdenum-oxide in the region (Hausel, 1988a). Mineralization was accompanied by silicification, and a distinct jasperoid is present locally. East of Black Buttes, auriferous jasperoid and feldspathic breccia are present in the Mineral Hill district (Hausel and Sutherland, 1988).

This summer, gold exploration continued at South Pass in the southern Wind River Range of

western Wyoming. Schuetz Tool and Die Company drilled along the eastern edge of the South Pass granite in structurally prepared sites, and trenching and drilling were reported elsewhere in the district by other companies. Activity was not as high as expected in that some Australian companies and a Canadian company with land holdings in the district were inactive because of financial losses suffered in last year's stock market decline. Additionally Gyorvary Mining Company, which was expected to begin mining this past summer, was unable to satisfy the Wyoming Department of Environmental Quality's rules and regulations.

Placer mining continued at the Stout mine on Rock Creek through the summer, and peanut and walnut sized nuggets were recovered by prospectors at a couple of locations elsewhere in the district. The possibility of large undiscovered gold deposits at South Pass remains very plausible. For example, one landowner in the district remembers an early 1970s drilling project by Anaconda Minerals Company on a paleo-channel of the Sweetwater River. According to the landowner, the property was expected to be surface minable at gold prices above \$200 per ounce. Maps and reports on Anaconda's project, however, are apparently not available.

A couple of interesting arsenopyrite-quartz vein samples were recently collected along the Sweetwater River in the Lewiston district of the South Pass greenstone belt. Most samples collected in the greenstone belt have relatively high Au/Ag ratios, but these samples collected in the SE/4 sec. 9, T.28N., R.98W. have anomalously low ratios. The sample from the hanging wall of the vein assayed 0.85 ppm gold with 130.0 ppm silver. The second sample with abundant arsenopyrite yielded 1.73 ppm gold with 24.0 ppm silver.

The Geological Survey of Wyoming also completed the eighth 1:24,000-scale quadrangle in a series of geologic maps covering the South Pass region. The eighth map of the series, the Louis Lake Quadrangle (Hausel, 1988b), is situated along the northwestern edge of the South Pass greenstone belt. This quadrangle includes a large section of the Louis Lake batholith, a felsic gneiss complex, serpentinites, talc-actinolite-chlorite schists, hornblende amphibolites, banded iron formation, and metagreywacke. The Atlantic City open pit iron mine, which has been closed since 1983, is near the southeastern margin of the quadrangle.

The Medicine Bow Mountains continued to receive attention for platinum, palladium, and gold. Geochemical exploration with some trenching and drilling was reported by some companies, and a fifth company recently moved into the area.

The Geological Survey of Wyoming recently examined several abandoned mines in the Sierra Madre, which are scheduled for reclamation by the Wyoming Department of Environmental Quality. Both selected samples and grab samples were collected from the mine dumps for assay. These samples illustrate two important things: (1) many of these abandoned mines contain potential metal resources, and (2) the Encampment mining district, known for its

historic copper production, must have also produced significant by-products gold and silver, which historians have generally ignored.

Possibly, the most interesting of these abandoned mine sites is site DEQ 17-6, located in Purgatory Gulch south of Encampment (Hausel, 1986). Following the discovery of Purgatory Gulch in the late 1800s, reports indicated some remarkably rich gold specimens were found. Some adits were driven into veins and shear zones, and placer deposits were mined in a portion of Purgatory Gulch in 1911 and 1912.

The DEQ 17-6 sample consisted of milky quartz filled with limonite boxworks. No visible gold was present. Another sample collected from the vein also contains abundant limonite boxworks in milky quartz with minor pyrite and one sliver of visible gold. This sample is available for inspection at the Geological Survey during normal working hours by contacting Dan Hausel at (307) 766-2286.

Turning to the Hartville uplift, various companies throughout the 1980s have explored that area for massive sulfides and unconformity deposits. Much of the attraction of the Hartville uplift is due to the variety of mineral deposits occurring there and to its exposed, extensive gossans. For example, there is the one-half mile long stratiform gossan found along 'gossan hill' in McCann Pass (sec. 26, T.28N., R.65W.).

Unconformity deposits in the uplift were targeted by Kerr-McGee Corporation in the uplift during the early 1980s. At one location (NW/4 sec. 13, T.27N., R.66W.) Kerr-McGee drilled and sampled an unconformity between Precambrian dolomite and Devonian to Mississippian quartzite and limestone. In one surface prospect, the exposed unconformity is stained with copper.

Samples taken along the unconformity contained copper carbonates with minor cerargyrite (Ag_2Ce), umangite (Cu_3Se_2), electrum (Au , Ag), and native gold. According to Kerr-McGee Corporation, this is only one of a few known localities in the world where the mineral umangite has been identified. Because of the significance of this discovery, Kerr-McGee Corporation recently donated a seven-page report on this deposit to the State Survey. This report is now available for free examination at the Wyoming Geological Survey Building on the University of Wyoming Campus. Photocopies can be purchased through the mail for \$1.50, which covers copying charges and first class postage.

During the past eight years, the Metallic Minerals Division of the Geological Survey of Wyoming has been involved in a research project to locate anomalous regions in the State that potentially could host diamond-bearing kimberlite intrusives. The success of this project has exceeded all expectations, and to date more than 1,000 stream-sediment samples

have been collected over an 800-square-mile region in the Laramie Mountains.

These stream-sediment samples were collected and panned in the field and the panned concentrates were later processed in the Survey's laboratories. These concentrates were microscopically examined for pyrope garnet and chromian diopside (two indicator minerals). More than 100 anomalies have been identified principally within three areas: (1) Happy Jack-Eagle Rock; (2) Middle Sybille Creek; and (3) Hallack Canyon-Laramie River (Hausel and other, 1988). In addition to the kimberlite indicator minerals, some other heavy minerals of interest were also noted such as gold, sapphire, and ruby.

The Metallic Minerals Division is planning a half-day seminar next spring for prospectors, geologists, rock hounds, and other people interested in how to locate kimberlite deposits and how to look for diamonds. Other topics will include gold prospecting and claim staking. For further information, contact Dan Hausel at (307) 766-2286.

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Fall Agricultural Outlook

Although the "drouth of '88" affected most areas of the United States, large carryover supplies of most grains and forages from previous years have prevented shortages and large increases in agricultural prices in the fall of 1988. Record amounts of red meat and poultry continued to be produced in 1988, even though the drought of 1988 raised grain prices and created uncertainties for 1989. The November 1988 estimate was for a 35 percent decline in production of feed grains and a 19 percent decrease in oilseed crops due to drought. While the available supply of these livestock feed ingredients is reduced and prices are higher, supplies will be adequate for domestic use and export through 1989, assuming we are not hit with another drouth in 1989.

Grains

Large carryover supplies coupled with rains in South America, have kept ample supplies of grains available for both domestic and world export demand. U.S. corn production is estimated at 4.67 billion bushels, down 34 percent from last year's 7.06 billion. Domestic winter wheat production was down marginally and total wheat production at 1.812 billion bushels was down 14 percent from year-ago levels. World prices will remain strong, however, due to shortfalls in production both domestically and abroad.

The U.S. and Russia extended their Long-term Trade Agreement (LTA), whereby the Soviets promise to continue purchasing U.S. grain. This by itself is not a strong bullish factor, but does provide greater stability to the market with the continued assurance that they will continue to buy U.S. grain. Now that the U.S. elections are over, traders are speculating that both the Soviets and China will step up purchases of U.S. grain. For the 1988-89 marketing year, however, the USDA forecasts total purchases to be at the lowest levels since 1979-80.

Wyoming production was down in all classes of grain in 1988. Corn for grain production is estimated at 4.5 million bushels, down 14 percent from 1987's 5.2 million. Winter wheat production was off 41 percent, declining to 4.95 million bushels. Wyoming's irrigated crops generally reflected increased production. Unless the state experiences an above average snowpack or greater than normal spring rains, irrigation water shortages are likely to develop in 1989, with resulting lower yields for all irrigated crops.

Livestock

Cattle prices have remained strong throughout the U.S., with price weakness

reflected in the pork, sheep and lamb industries. The recent trend of increased poultry and pork supplies offsetting lower beef supplies as cattle inventories begin to stabilize, will continue as we move into 1989.

Hog prices declined sharply this fall under the weight of larger slaughter and heavier marketing weights. Pork production during the October-December quarter is expected to average about seven percent above last year and nearly 15 percent higher than during the summer quarter. Hog prices slumped to the upper \$30's in October, about \$10 below both last year and the early summer highs. Retail pork prices have declined much less than hog prices, resulting in wider farm-retail price spreads. However, the demand for pork appears to have remained strong. A continuation of current price/quantity relationships will provide a springboard to higher hog prices this winter.

Retail pork prices averaged near \$1.86 per pound during the July-September quarter. This was about one percent above the previous quarter, but five percent under a year ago. Although pork prices were under last year, the decrease was modest in light of a 12 percent increase in pork production. In contrast, hog prices dropped nearly 25 percent below a year earlier, averaging about \$44.25 per cwt compared to \$59.00 in the third quarter of 1987.

The larger pork output in recent months has reduced pork prices, but the decline has been modest in relation to the supply change. During the July-September quarter consumers were willing to take more than nine percent more pork per person off the market at an 11 percent lower income-deflated price. Pork demand appears to have declined in the mid 1970's and again in the early 1980's.

In comparison with other meats during the July-September quarter, demand for pork appears to have strengthened at the expense of beef. This shift may be a reflection of increasing beef prices in relation to pork. As the spread between beef and pork prices has widened, consumers have turned to lower priced pork items in preference to beef. In turn, lower priced chicken and turkey remain strong competitors with pork for the consumer's meat dollar.

Large price premiums for feeder cattle and higher grain prices have resulted in tight feeding margins and resulting lower feedlot placements. Lower feedlot placements, in turn, will lead to lower fed cattle marketings in the months ahead. Along with smaller feedlot marketings, cow slaughter is also expected to remain below a year earlier. Higher average carcass weights will continue to offset part of the decrease in number of cattle slaughtered, but beef production is still expected to remain well below a year earlier. Smaller beef supplies will be the key factor supporting

higher cattle prices, however the direction of the U.S. economy and consumers response to record high beef prices will also affect price strength.

Beef production is expected to average one percent under last year during the October-December quarter, but larger declines are anticipated in 1989. January-March 1989 beef output is projected down three percent followed by a four percent decrease in April-June; a six percent decline in July-September; and an additional three percent drop in October-December. For the year, 1989 beef production is estimated near 22.5 billion pounds, about four percent or almost one billion pounds below 1988.

Smaller beef output will obviously curtail per capita consumption. Disappearance will average near 73 pounds per person (retail weight) in 1988, about one percent below the 1987 figure and the smallest since 1963. A four percent decrease to around 69.6 pounds is anticipated in 1989.

Retail beef prices, supported by slightly smaller per capita supplies, higher consumer incomes, and record employment, are likely to average near a record \$2.55 per pound in 1988, five percent above last year. A similar five to seven percent retail price increase is anticipated in 1989.

If consumer demand for beef is sustained at recent levels and cattle feeders control marketing weights, further increases are anticipated in both retail beef and live cattle prices in the coming months. October-December choice slaughter steer prices are expected to average in the \$71.00 - \$73.00 area. As beef supplies decline seasonally and in relation to last year, prices are likely to trend higher.

Choice steers in the southern plains are expected to average in the middle \$70's during the January-March and approach \$80.00 in the April-June 1989 quarter. Major uncertainties relating to these price expectations include consumer response to further beef price increases and the ability of cattle feeders to reduce slaughter weights by getting marketings current.

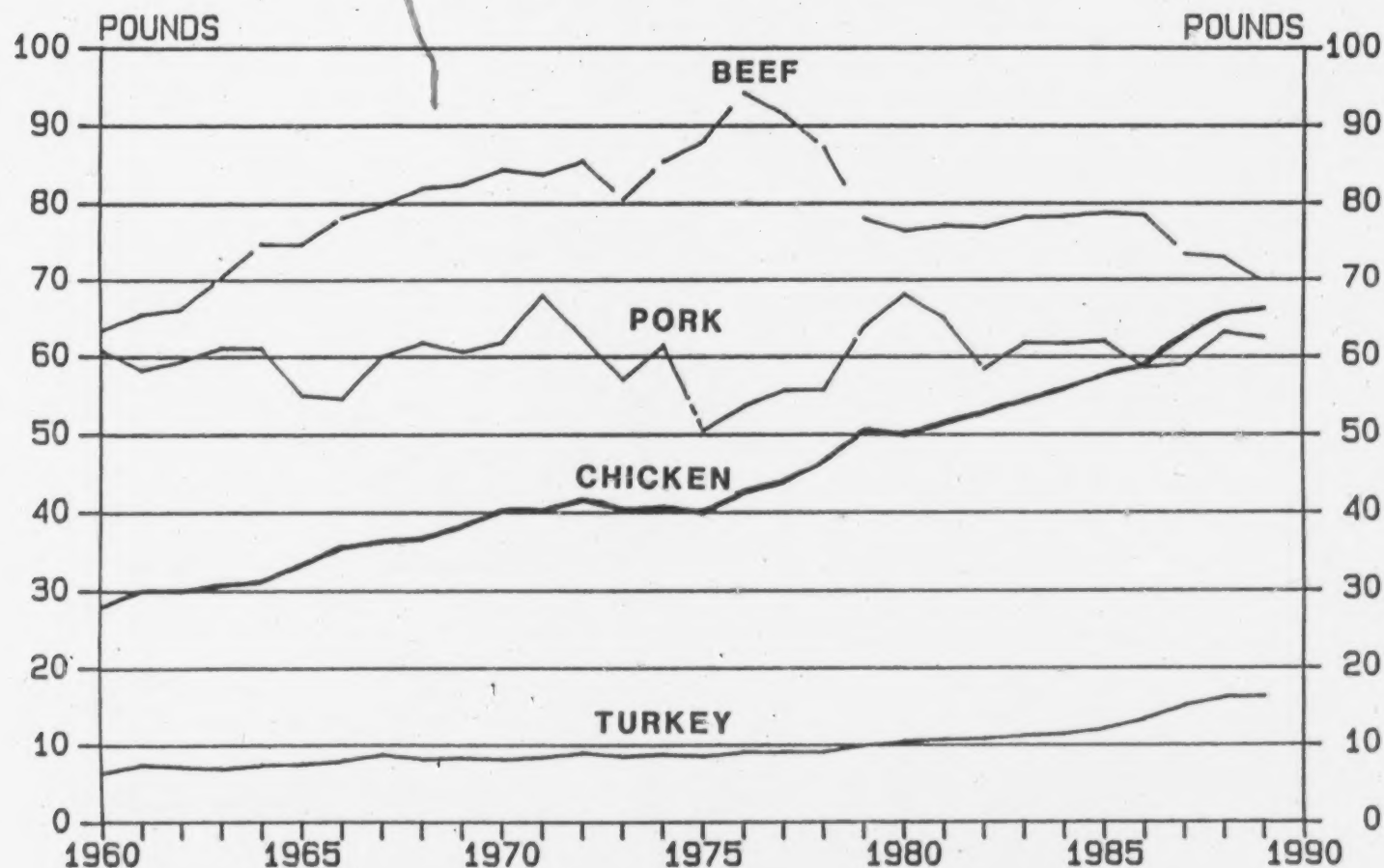
Although decisions may yet be altered by the effects of last summer's drought, some cattlemen are expanding their cow herds. The number of new heifers entering the beef herd during the first half of 1988 was calculated near 18 percent higher than a year earlier. Additionally, beef cow slaughter has averaged about eight percent under 1987. Current projections suggest the January 1 cow herd may be slightly larger than a year earlier. This modest herd rebuilding also reduces the number of cattle available for feedlot placement.

Despite expectations for generally higher cattle prices during the months ahead, cattle feeding margins will remain narrow. Projected breakevens for steers to be marketed in December are near \$75 and rise to \$75-\$77 in January/February 1989. Rains in South America may provide marginal relief in feed grain prices this winter, however feeding margins will continue to remain tight until the 1989 corn crop is determined.

*Robert D. Carver
Extension Economist
University of Wyoming*

BEEF, PORK, AND POULTRY CONSUMPTION

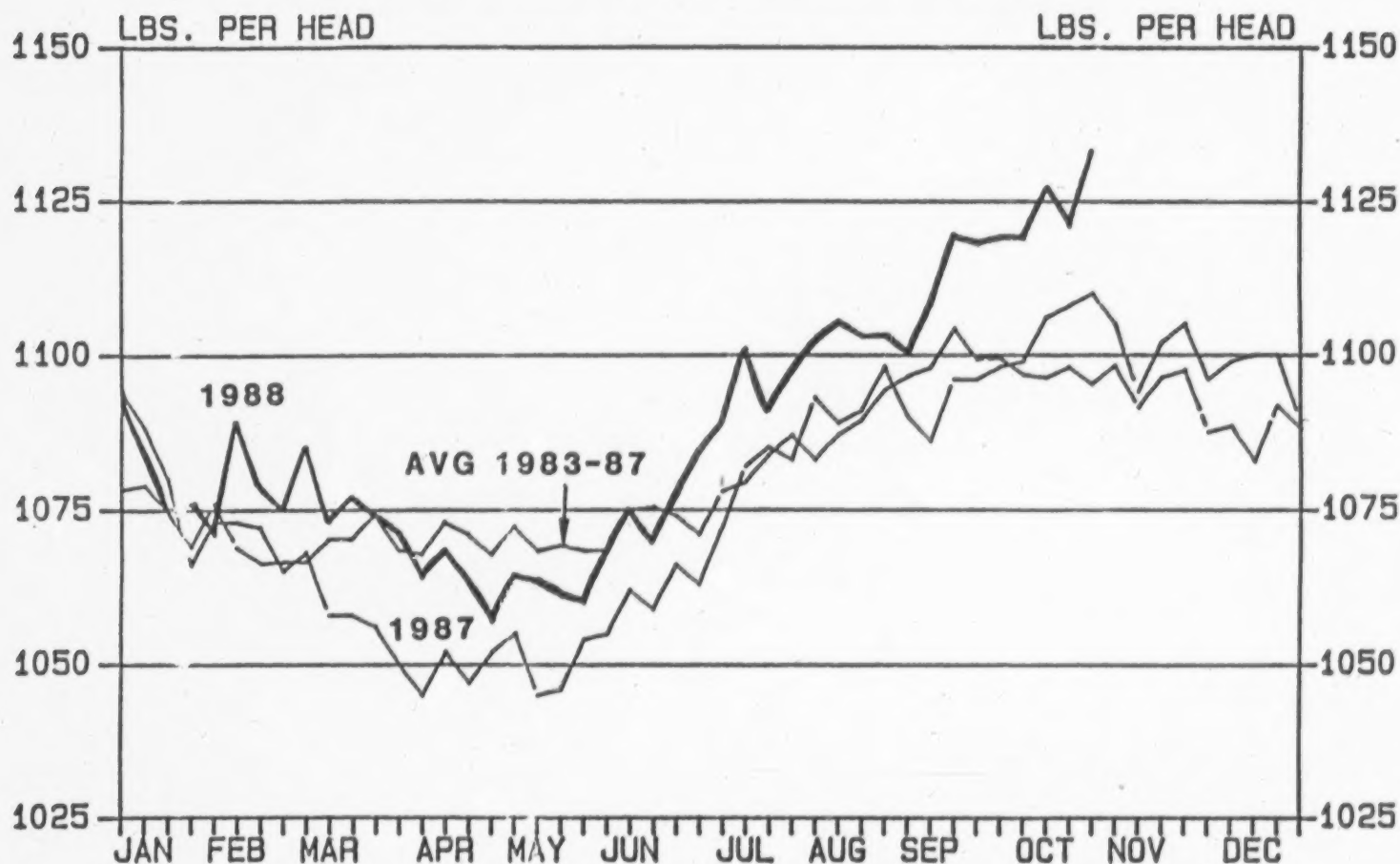
ANNUAL PER PERSON, RETAIL WEIGHT



Western Livestock Marketing Information Project
Cooperative Extension Service

WEEKLY AVERAGE LIVE WEIGHT

TEXAS/OK PANHANDLE, STEERS AND HEIFERS

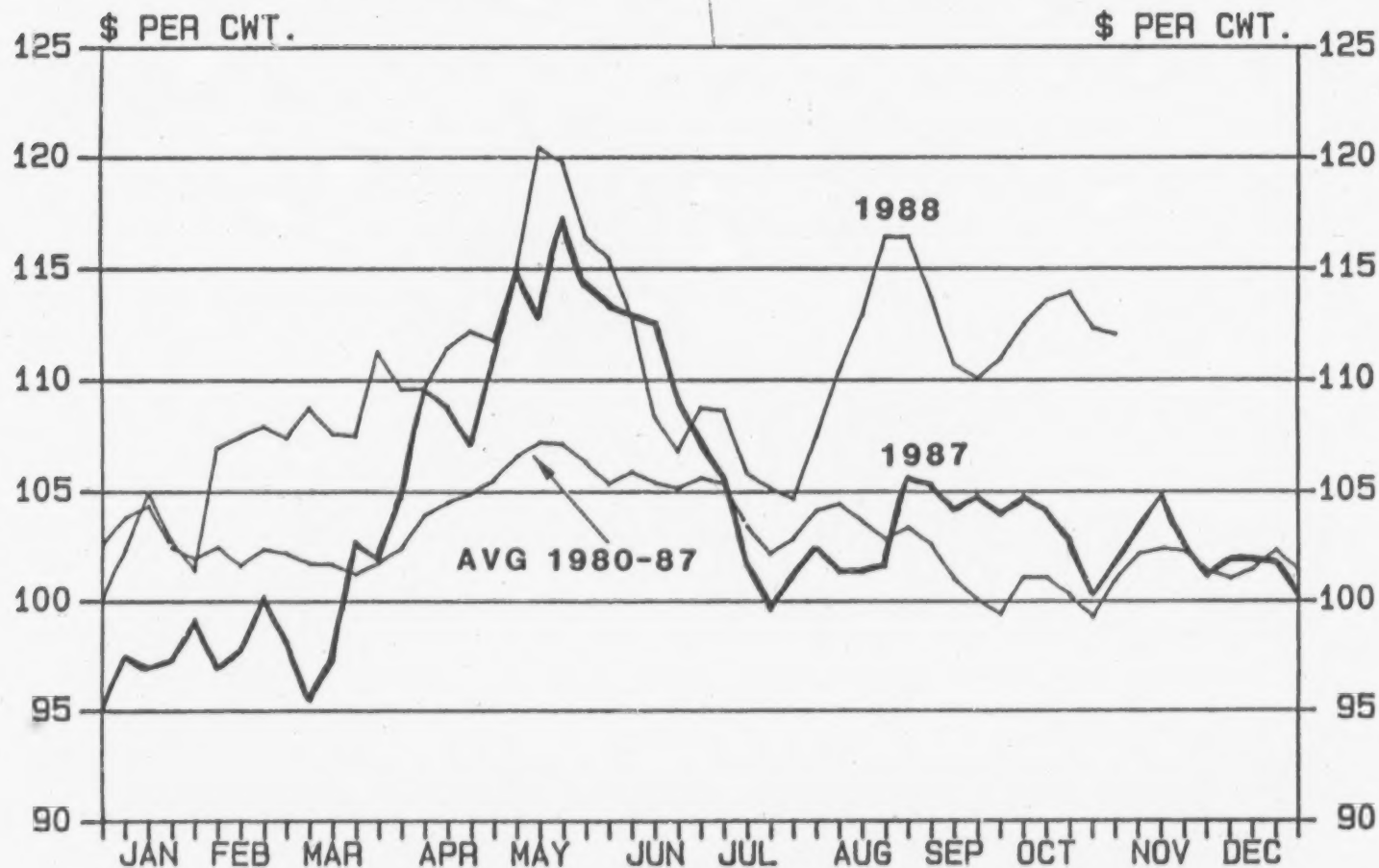


WESTERN LIVESTOCK MARKETING INFORMATION PROJECT

COOPERATIVE EXTENSION SERVICE

BOX BEEF CUTOUT VALUE

WEEKLY, 550-700 LB. CHOICE 1-3 CARCASS



Western Livestock Marketing Information Project
Cooperative Extension Service

Job Openings Outlook

Word Processing Machine Operators

Word processing operators input information on specialized equipment to produce printed materials from manuscripts or other documents. They type materials such as correspondence, reports, and legal documents onto electronic disks or tapes which are used for automatic reproduction. The typed material is displayed on the machine's video screen, and the machine operator reads and corrects typographical, spelling, punctuation, and grammatical errors. They may also combine information from several different disks or tapes with other data sources to produce a report. They maintain disk or tape libraries and keep logs for easy storage and retrieval of information. They may discuss format and language usage with document writers or transcribe information from recorded message onto the word processing equipment.

Word processing machine operators must possess above average ability to see details and slight differences in objects and to proofread words and numbers accurately. Good eye-hand coordination and finger dexterity are important physical attributes. The ability to develop, and adapt to, new procedures is an important characteristic of word processing machine operators.

Word processing machine operators usually work indoors in offices for 40 hours/week. Approximately 80 percent of the time is spent sitting and doing repetitive work. Employers are governmental agencies, legal firms, hospitals, insurance companies, businesses and schools.

Many employers prefer high school graduation. Some employers will provide on-the-job training in word processing if the applicant can type 50 to 60 words per minute accurately and has had some office experience. However, opportunities for employment are better for the applicant who has word processing experience or has completed a word processing training program. This small occupation employs about 260 word processing machine operators in Wyoming. Secretaries usually perform word processing tasks. The average entry wage is from \$720-\$950/month. Maximum wages range between \$1,200-\$1,600/month.

Currently there is a shortage of trained word processing operators and the demand is expected to grow. This is a changing occupation and not enough workers have been trained to fill new openings. Clerical occupations, as a whole, are expected to increase at a better than average rate over the next decade due to a growing volume of printed information. The use of word processing equipment is increasing because it is usually more efficient than the typewriter and can more easily store information. It is expected that in the near future most word processing machines will be connected to mainframe or small desk-top computers.

Hotel and Motel Managers

Hotel and motel managers direct the business operations of hotels and motels to

serve their patrons. Common to any manager's job is the profitable administration of the establishment's activities. Specific duties vary according to the size, type, and location of the business. Managers in large hotels and motels mostly concentrate on administration such as hiring personnel, directing publicity, buying or supervising the purchase of supplies, and determining room rates and credit policies. In addition to the above, managers of small firms may also relieve the desk clerk and perform clerical work, cleaning tasks and general building repairs.

Hotel and motel managers must have the ability and desire to work with people. They must be able to give directions and to communicate both verbally and in writing. Attention to detail, initiative, tact, and assertiveness are characteristic of managers.

In large hotels or motels, general managers supervise assistant and departmental managers, such as those in the front offices, house-keeping, restaurant, maintenance or service. In small hotels and motels, management is done by the owner who often does all the work with the help of one or two assistants and lives on the premises. Most of the general manager's time is spent indoors. Weekends and night work is common.

Although experience is of prime importance, employers increasingly emphasize a 2-year or 4-year college degree in hotel administration or in fields such as business administration, accounting, or marketing.

This is a medium-sized occupation in Wyoming. There are approximately 400 motel/hotel properties in the state. Wages vary with experience, education, and size of establishment. Entry rates generally start between \$800-\$1,200/month. Managers may receive bonuses, lodging in the hotels, meals and other services. Maximum earnings range between \$1,500-\$2,500/month. Managers of larger establishments earn more.

Currently there is a shortage of qualified applicants in this occupation. The future outlook for this occupation depends on economic conditions, level of tourist industry and expansion of the hotel-motel and recreation industry. Demand is strongest in recreational areas which attract tourists and commercial travelers. Individuals with previous management experience or knowledge of the food, beverage and hotel facets of the business will fare best. Knowledge of computer systems for hotel and motel management is becoming increasingly important.

Individuals with no experience and no formal training in this occupation begin in an entry-level position such as a clerk or housekeeper and are promoted with experience. Studies indicate front office work is an important step to management positions. If working for a large chain operation, willingness to relocate often helps advancement opportunities.

*Maria Aguire, WCIS
Suzanne McGuire, WCIS*

Wyoming Coincident Indicators Index

The second quarter 1988 seasonally adjusted Wyoming Coincident Indicator Index (WCII) continued to hold at a level maintained now for eight quarters since mid-1986. For this eight-quarter period the index has been quite stable and shows a very slight upward trend. The WCII is derived using several economic variables which tend to change coincidentally with the overall Wyoming economy. The index is computed quarterly by the Division of Research and Statistics, Department of Administration and Fiscal Control.

The WCII is composed of four variables which are: 1) total State employment, 2) total wages reported for the quarter, 3) total sales and use tax collections, and 4) an industrial index. The industrial index is a composite of variables which represent three important Wyoming industrial sectors. For the industrial index, mining is represented by the number of active oil well drilling rigs; the agricultural sector is represented by an index of prices received for all Wyoming agricultural commodities; and tourism is represented by the total volume (in gallons) of motor fuels plus gasohol sold.

An annual comparison of seasonally adjusted values (second quarter, 1988, to the second quarter, 1987), shows a decline only for employment which is off 2.5 percent from the previous year. The other three variables are up from the second quarter of 1987. The industrial index is up a solid 6.6 percent; total sales and use tax collections are up 6.7 percent; and total wages reported are up 2.4 percent. The 6.6 percent increase in the industrial index is led by a 22.1 percent increase in the oil drilling rig count. However, the agricultural commodities price index is also up by 4.3 percent; and total motor fuels plus gasohol sales are up by 2.3 percent. Overall the second quarter 1988 index is up from the second quarter of 1987, but only by 0.4 percent.

On a quarterly basis, the second quarter 1988 seasonally adjusted WCII is down by 0.4 percent from the first quarter of 1988. Two of the four variables are down. The industrial index is down 2.6 percent, and total employment is down 2.2 percent. Total reported wages are up 3.0 percent, and sales and use tax collections are up 1.5 percent. Changes for the three component variables of the industrial index are mixed. The oil drilling rig count is down 6.5 percent; the agricultural commodities price index is down 4.4 percent; and total gallons of motor fuels plus gasohol sold are up 3.8 percent.

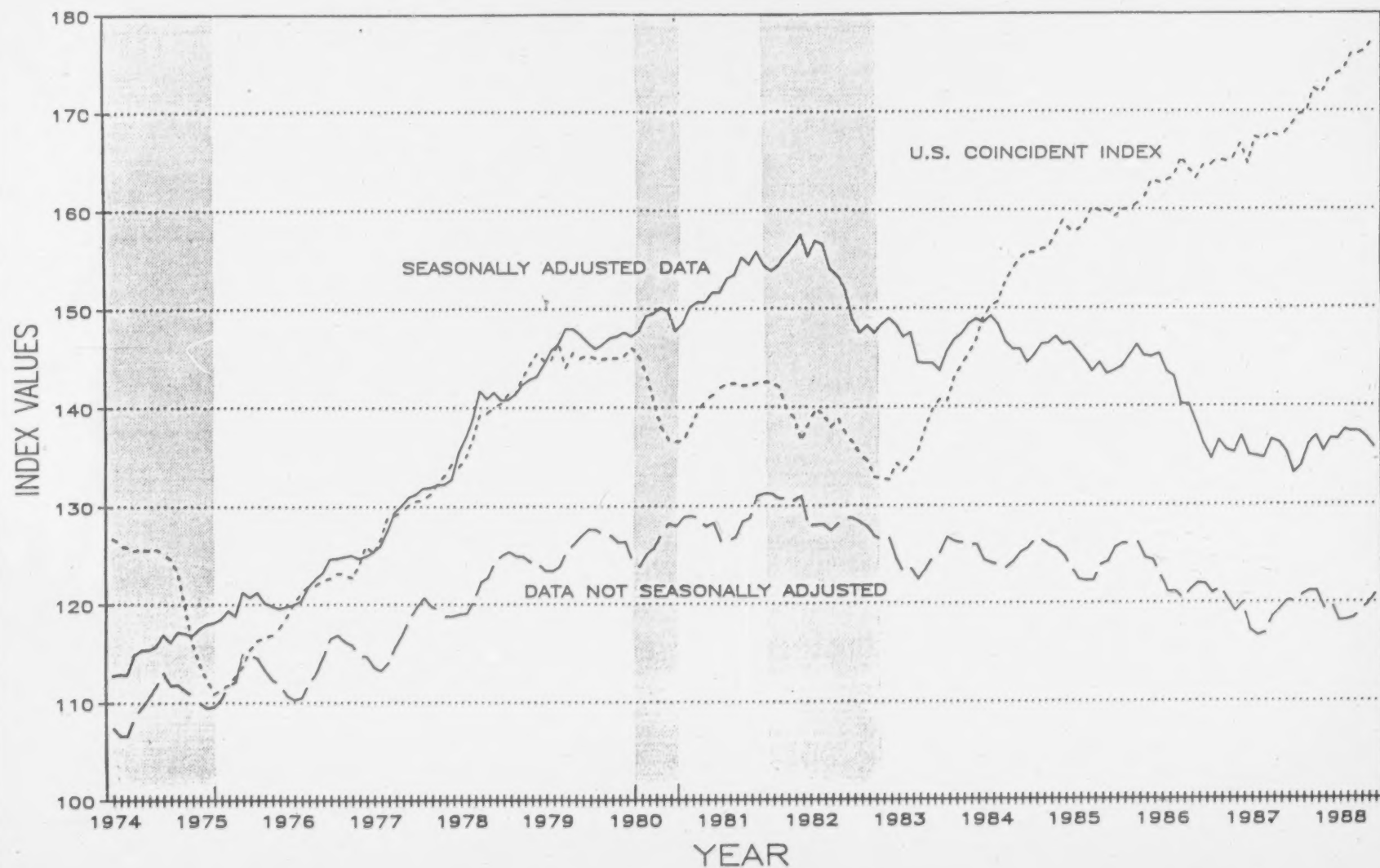
The seasonally adjusted WCII has now held at a stable level for two full years with indications of a very slight upward trend. Barring any major new shocks to the State's economy, it is beginning to look as if the economy has reached the bottom of an economic cycle and may actually be slowly starting to advance. The industrial index is up 6.6 percent over the previous year. Even more encouraging is the fact that three of the four WCII variables have once again registered year to year gains and the overall index is up. However, on the cautionary side, the industrial index did drop 2.6 percent from the previous quarter. Continued weakness in oil prices could have a stronger negative effect in the future.

Early signals for the third quarter of 1988 indicate that the overall WCII will again hold in the same range as it has been for the past eight quarters. On a year-to-year basis, employment may be about even with the previous year level. Sales and use tax collections are up 11 percent based on July and August data. The industrial index is uncertain but may be down because the oil drilling rig count is down 7.2 percent and the agricultural commodities price index is only up 3.8 percent. On a quarter-to-quarter basis, the results look about the same. Employment is down 3.2 percent from the second quarter, based on data for July and August. The industrial index looks like it may be up, with the oil rig count up 13.5 percent and the agricultural commodities price index up 3.4 percent. Sales and use tax collections are up 1.2 percent over the second quarter, based on data for July and August. All changes refer to seasonally adjusted data.

Steve Furtney, Economist
Wyo. Dept. of Administration
and Fiscal Control (DAFC)

WYOMING COINCIDENT INDICATORS INDEX JANUARY 1974 THROUGH JUNE 1988

OCTOBER 9, 1988



Shaded areas represent U.S. recessionary periods.

**THE WYOMING
ECONOMY**

The Wyoming Economy: A Status Report*

INTRODUCTION

For years Wyoming has been the victim of an economic boom-bust cycle. And for years, the lack of diversification of the economy has borne the brunt of the blame. Now recovering from one of its worst recessionary periods, Wyoming is embracing economic development and diversification with renewed vigor.

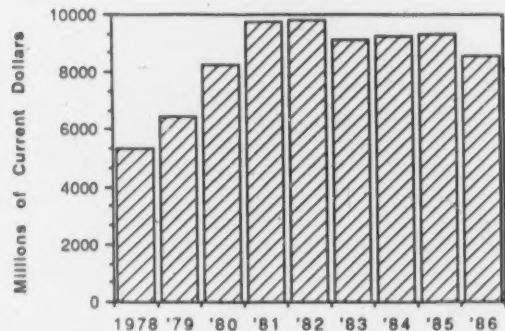
Public recognition of the need for economic diversification is not new. For example, a 1956 report by the Wyoming Natural Resources Board recommended that "diversification can be one large answer to provide...employment advantages." Again in 1962, a study prepared for the Wyoming Natural Resources Board by the Chicago-based Armour Research Foundation stated that the "State must be more aggressive in its actions toward attracting industry." (EDSB, 1988) Perhaps the time is ripe for the state to heed this consistent advice as it attempts to turn the economy around.

One barometer of current interest in economic development was revealed in the Wyoming Heritage Foundation's recent public opinion poll. Given an opportunity to discuss with Governor Sullivan any one issue facing the state today, 53 percent of those surveyed selected economic problems as the most pressing. Social problems and the education system, the next most frequently mentioned problems, were chosen by 5 percent and 4 percent of the respondents respectively.

The Wyoming economy is dominated by three major industries: minerals, agriculture, and tourism. During the oil embargo and energy conservation measures of the early 1980's, the Wyoming economy experienced hitherto unknown peaks. When the price of oil dropped drastically, so too did the Wyoming economy decline. The economy has finally stabilized and is, in fact, beginning a gradual recovery.

*The author appreciates valuable assistance provided by Clyde Douglass, Wyoming Travel Commission; Steve Furtney, Research and Statistics Division (DAFC); Gary Glass, Wyoming Geological Survey; Earl Kabeiseman, Department of Revenue and Taxation; Anne McGowan, Economic Development Library; Max Maxfield, Recreation Commission; Dan Perdue, EDSB; and Don Rolston, Department of Agriculture. However, the author, rather than these individuals is responsible for any remaining errors in the text. Also, conclusions or opinions expressed in this article are those of the author and do not represent the official position of the University of Wyoming or any other State organization.

Gross State Product



Although the nation as a whole seems to be recovering from the recession of the early 1980's, Wyoming's economy is not rebounding with comparable vitality. The nationwide expansion is affecting the Wyoming economy only peripherally. The most recent Wyoming Coincident Indicator Index (WCII) measures four variables: employment, wages, sales and use collections, and an industrial index representing the three major industrial sectors. (See page 19) The WCII has been stable for two full years, with the beginning of a very slight upward trend. It appears that the Wyoming economy has finally "bottomed out." Nevertheless, the upward trend is sufficiently gradual to promote only guarded optimism.

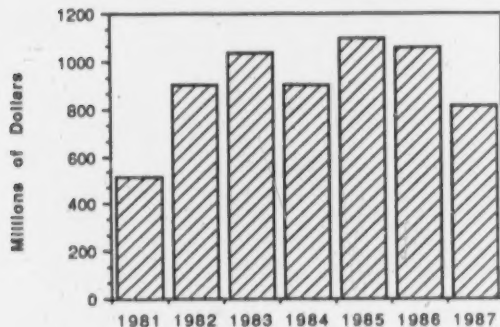
MINERALS

One only needs to hear of the declining oil prices or to pay a visit to central Wyoming towns dependent on mining to realize that the minerals industry, and thus the Wyoming economy, has taken a beating in the last several years. The minerals industry represents as much as 60 percent of the State's total valuation. Mineral income to the State of Wyoming was \$808,832,187 in fiscal year 1987. Of this, 44.8 percent was returned to the counties through the ad valorem tax.

Wyoming is extremely fortunate in having a variety of natural resources at or near the surface. The diversity of mineral resources constitutes one of Wyoming's greatest long-term assets. However, market demands for minerals change for a variety of reasons: technological advances, legislative decisions, and international political or military activities. This means, unfortunately, that much of the market demand is externally controlled. The

minerals industry is destined to remain heavily reliant on economic forces over which the state can exercise little influence.

Mineral Income to the State of Wyoming



Wyoming's primary minerals are oil, coal, and natural gas. Together, these three account in almost equal amounts for most of the mineral revenues. Other minerals such as trona, bentonite, and uranium have a smaller impact on the overall economic picture.

Oil

Wyoming leads the Rocky Mountain region in oil production and is sixth nationwide. But the collapse of oil prices, which has devastated the U.S. petroleum industry, has not spared Wyoming.

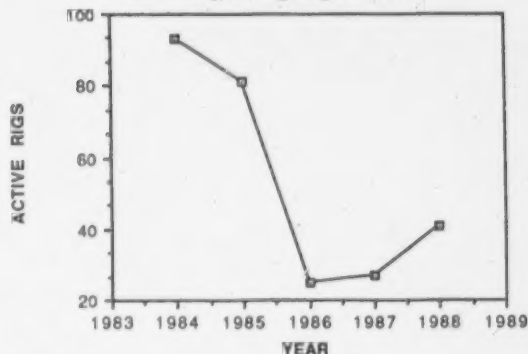
Oil production peaked in 1970. When the price of oil reached \$30 per barrel in the early 1980's, largely due to the OPEC oil embargo and national conservation measures, assessed valuation based on taxable production of Wyoming oil reached an all-time high. Because of the current drop in oil prices, both oil production and exploration have drastically declined.

Wyoming oil typically sells for about 80 percent of the price of West Texas crude which is the oil typically quoted. It costs at least \$13 to recover a barrel of Wyoming oil. Occasionally one discovers a field of surface oil that can be recovered for \$10 per barrel, but this occurs rarely. Oil producers can barely break even when the price is as low as it is currently: \$12-\$15 per barrel.

There have been volatile changes in the number of rigs operating in Wyoming. The problem is a lack of investment capital. Producers are hesitant to invest in new wells when the price of oil is liable to fluctuate.

Enhanced oil recovery (EOR) is a developing technology that utilizes injected liquids or gases to boost the amount of crude oil that can be recovered from oil-producing formations. Potential additional oil production using existing EOR techniques on known reserves could reach 1.5 billion barrels. The new technology could add significant production life to many Wyoming reservoirs, thus extending the current tax base support for many years.

Wyoming Rig Count



Forecast for oil

The forecast for oil prices looks for a slow recovery during 1989. The current flooding of the oil market is thought to last only six months. It is cautiously estimated by the Minerals Valuation Group that the price of oil will slowly recover to an average price of \$15/barrel by 1990. Taxable oil production is predicted to decline 13 percent over the next five years, mostly due to the lack of explorational drilling and some oil moving into tertiary classification.

Natural Gas

Natural gas production is the bright point in the minerals outlook for Wyoming. The current emphasis on natural gas as a clean burning fuel enhances its appeal.

Industrial, commercial, and domestic heating and fuel for industrial processes are virtually the only markets for natural gas. The precipitous drop in oil prices had contributed to some decline in natural gas production, since much gas is produced as a consequence of oil drilling. However, the nationwide economic expansion stimulated an increased demand for natural gas.

Forecast for natural gas

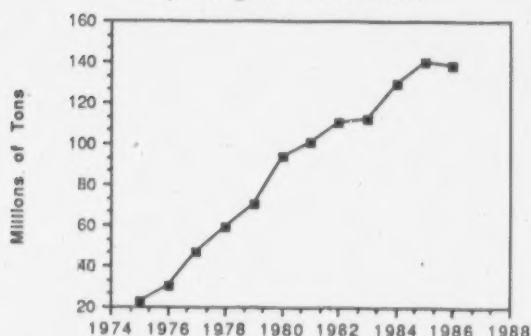
If the California pipeline is approved and implemented, drilling will be spurred. The glut of gas reserves is finally disappearing. 1988 was the first year in some time to see a price increase in natural gas. The unit cost is still low (\$1.80 MCF) but demand is high. The forecast is for increased production throughout the next five to ten years.

The Mineral Valuation Group's forecast for the natural gas market is promising with demand high, the supply glut fading, and prices still competitive with alternate energy sources. Taxable production is assumed to be 60 percent of gross production due to 1988 legislation which allows for exemptions. The California natural gas pipeline, although probable, is not considered in their forecast. Its completion

could add \$6 million, or 25 percent of the total, to revenues in 1992 alone.

Coal

Wyoming Coal Production



Wyoming coal production has increased over 15-fold in twenty years. In 1969, total coal production was just 2 million tons; this year, coal production reached 153 million tons. Wyoming and Kentucky vie for placement as the nation's largest producer of coal.

A major problem in marketing Wyoming coal is the high price of transportation. Transportation costs exceed the costs of the coal by as much as three times. The heat value per ton shipped and thus the transportation cost could be improved if the coal is dried first; some producers are now drying coal prior to shipping to gauge the overall effect on costs.

Relatively low coal prices are contributing to the current boom in production. For example, the price of Powder River coal has been diluted to under \$4 per ton, compared to the \$6-\$7 level of a few years ago. Despite increased production, each mine is still producing under capacity. Nevertheless, with the lower prices, the taxable value is down.

Wyoming coal is less expensive by about one-third than coal mined in the eastern U.S. The sulfur content of Wyoming coal is lower and thus it is less polluting. Air pollution laws of the early 1970's increased demand for Wyoming coal. Acid rain legislation will have a varying effect, depending on its wording, but could place a premium on Wyoming's low-sulfur coal.

The Three Mile Island and Chernobyl catastrophes virtually eliminated demand for uranium and increased the attractiveness of coal-generated power plants. Coal enhancement through drying could further enhance the marketability of Wyoming coal. Gasification and liquefaction processes also have the potential to expand the market for Wyoming coal.

Forecast for coal

During last summer's drought, hydroelectric power plants decreased production, thus increasing demand for coal-generated electricity. Additionally, the high temperatures nationwide bolstered air conditioning usage. The effect of the heat and drought of the past summer, combined with low coal prices,

have helped the Wyoming coal industry hit a likely record production year. Gross production is predicted to level out and stabilize in 1989 and 1990 and gradually increase in later years. However, taxable production will be eroded by exemptions caused by the increase in Federal Mineral Royalty rates on coal. Prices are expected to continue to gradually decline.

Trona

Wyoming supplies 95 percent of the trona market nationwide. It is difficult to break into the export market because foreign countries manufacture synthetic trona and thus maintain a high labor force. Because of this it is unlikely that many countries will change to the U.S. market for trona, even though it costs less than synthetic trona.

Economic outlook for minerals

There is no boom in the near-term horizon. There is a possibility of another boom in the late 1990's if increased demand for coal-generated power plants continues.

Natural gas production will continue to gradually increase. Of course, implementation of the California pipeline would provide a welcome boost to the industry.

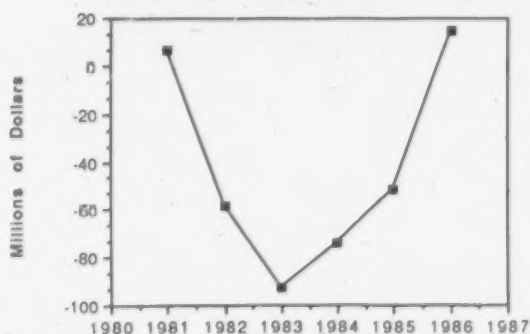
The scenario for oil mirrors a "yo-yo" effect. Prices will vary from \$10-\$18 and back again. If oil production would stabilize at \$15 or more instead of incessant fluctuation, there would be a stronger stimulus for increased exploration and drilling.

Wyoming minerals production is generally healthy. Although overall production is not expanding, it has reached an adequate plateau. The problem is not so much one of declining production, but of declining prices. But the industry is not foundering. The future will see a fairly robust mineral industry at its current level. There will be no huge increases but neither are huge declines in sight.

AGRICULTURE

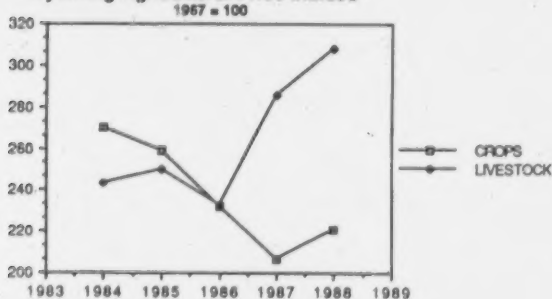
Agriculture has always been a major industry in Wyoming and its importance to the State's economic stability will continue. Total cash receipts from Wyoming agricultural production in 1986 amounted to almost \$566 million. Agriculture-related jobs account for 13.4 percent of the State's total work force.

Wyoming Net Income from Farms



Although figures show that Wyoming net farm income is slowly increasing since the recession hit its depth, the number of cattle and sheep has been steadily declining. This is significant because approximately 80 percent of Wyoming's agricultural income comes from livestock. In fact, there are only a few cash crops sold: sugar beets, malt barley, edible beans, and a few others. The largest part of crop production goes to support livestock.

Wyoming Agricultural Price Indices



Until recently, livestock prices were relatively low. Currently, following the national trend, both beef and sheep prices are strong and steadily rising. For example, beef prices range from \$0.98-\$1.15 per pound, up from \$0.68 a few years ago.

When land values dropped in the early 1980's, Wyoming's farmers and ranchers encountered serious problems. There were numerous foreclosures and bankruptcies. The agricultural sector has recovered to a degree in certain areas. It has reached its low point, but not yet seen a total recovery. The agricultural sector of the economy is still coming out of the recession--the worst since the Great Depression of the 1930's.

Most agriculture prices in Wyoming are related to production, not processing. (One exception is sugar beets which go through the entire process in-state.) It has been too expensive for Wyoming to compete with national conglomerates in the processing of crops and livestock. It is more successful, given the state's location and transportation limitations, to process the products elsewhere.

Because Wyoming's population is so small, there are insufficient numbers of consumers to support the agriculture industry. Thus, agriculture runs on an export base.

Agriculture-related businesses are a large piece of the economic pie in any state. However, there are currently no accurate statistics to measure these businesses separate from other industries. The Agriculture Commission is working with the University of Wyoming College of Agriculture to develop a way to measure the total impact of agribusinesses on the economy.

Wyoming Department of Agriculture

The Wyoming Department of Agriculture, created in 1921, supports the State's

agriculture industry and implements consumer protection programs in the interest of the health and welfare of its citizens. The Division of Marketing works to promote and expand markets for Wyoming agricultural products. The Division works to create an awareness about Wyoming products through national and international food shows and trade missions, evaluation and support of production and processing of alternate crops, and support of direct marketing activities. The Division has been instrumental in helping Wyoming hay producers export alfalfa cubes to Japan and in helping Chugwater Chili establish itself in retail markets.

Some efforts at economic development in the agriculture industry include:

(1) Specialized marketing. Although livestock prices are closely tied to national trends, there is an opportunity for ranchers to market their livestock more efficiently. For example, the Wyoming Wool Growers are trying to develop a market for Wyoming lamb. Both the lamb and beef industries are looking to brand names that impart high value to consumers. It is crucial for the agriculture industry to find a good market for existing products.

(2) Processing facilities. In most cases it has been unprofitable for Wyoming businesses to compete nationally with processing plants. There is no use putting money into a processing facility if it is not going to be financially rewarding. There is, however, a pilot project for lamb processing underway at the Honor Farm.

(3) Expansion of existing businesses. It is especially important in the agriculture sector to support small businesses that are already capitalized within the state. The Department of Agriculture will help these firms position the right product at the right place at the right price.

Economic outlook for agriculture

Wyoming livestock prices tend to follow the national trend. If current price levels are maintained, the outlook will be promising over the next several years.

If the State wants to expand its agricultural economy, it must look at current resources and develop programs from within. For agriculture, the key to economic development is not to bring in new, diversified businesses, but to take existing resources and develop them. The goal should be to keep the ranchers and farmers on the land - to return production profit to farmers and ranchers. By so doing, the State ensures the infrastructures will stay in place and communities will have a stable source of population support.

RECREATION AND TOURISM

Tourism is a growth industry. The U.S. Travel Data Center has estimated that income from tourism added \$771 million to Wyoming's budget in 1986. In addition, Wyoming tourism generates over 19,000 jobs, accounting for 9.4 percent of the total payroll. It is clear that tourism exerts significant influence on Wyoming's economy.

Since 1983, there has been a modest 3 percent increase - to 160,000 - in the number of visitors to Wyoming's parks and historic sites. Add to this the 2.4 million visitors to Yellowstone National Park, 2.1 million to Grand Teton National Park, and nearly 750,000 visitors to Big Horn Canyon National Recreation Area, Fort Laramie National Historic Site, and Devil's Tower and Fossil Butte National Monuments. There is obviously some overlap in the number of visitors. Nevertheless, this visitor count represents only a fraction of the total tourism picture in the State. The Wyoming Travel Commission is working with the Department of Revenue and Taxation to hone the process of estimating tourist dollars. It is a complex process; for example, it is difficult to determine which sales and gasoline taxes are paid by tourists rather than by residents.

Wyoming Travel Commission

The Wyoming Travel Commission was created to represent the economic, social and geographic interests of Wyoming. It distributes information concerning the scenic and recreational opportunities and resources of Wyoming. The task of promoting the vacation and travel attractions on a national and international level is the responsibility of the Commission.

The Commission recently completed a comprehensive marketing study to gauge people's perceptions of Wyoming. Unfortunately the results indicated that many people in the nation just don't consider Wyoming as a potential vacation spot. Neither positive nor negative, Wyoming seems to suffer from a neutral, or even nonexistent, image. Through its promotional activities, the Travel Commission is spiriting Wyoming as a Rocky Mountain, family-oriented vacation spot.

The Travel Commission has several opportunities to increase tourism:

(1) Continue the electronic media campaign in select metropolitan markets. As a result of its marketing study, the Travel Commission identified Wyoming's major tourism markets as southern California, the farm belt, and the Great Lake States. It initially embarked on an ambitious million-dollar electronic ad campaign in Chicago, Minneapolis-St. Paul, and Kansas City. The 30-day campaign was followed by a survey which indicated that name recognition for the state increased from 1-2 percent to 16-32 percent in the locales where the advertisements appeared. During the initial campaign in spring 1987, nearly 13,000 inquiries were received despite the fact that the campaign was primarily "image building" rather than response oriented. With the results of the electronic ad campaign in hand, the Travel Commission is expanding this year's advertising campaign to additional cities within its target market.

(2) In addition to this media campaign, the Commission is advertising Wyoming vacations internationally. There is significant potential in Europe; for example, Germans are the single largest group of foreign visitors to Yellowstone Park.

(3) The Commission is aggressively trying to negate the detrimental publicity on last summer's Yellowstone fires - to convince

prospective visitors that the major attractions are still in place and Yellowstone is even more unique now. To this end they are producing a new slide show on Yellowstone and a brochure illustrated by impressive color photographs taken both during and after the fires. It is clear that due to the severity of the fires, the number of visitors to the Yellowstone area had decreased by the end of the 1988 summer season. One indication of this can be found in selected Colorado areas which experienced as many as 50 percent more visitors with no significant increase in advertising. Now that the fires have put Yellowstone on the national map, the challenge will be to maintain the curiosity and provide factual information about the unique beauty of the park.

(4) Through the Travel Marketing Matching Fund Program, the Commission encourages and assists individual community interests to market their own travel attractions and opportunities.

Wyoming Recreation Commission

The responsibilities of the Wyoming Recreation Commission end at the state line. Their job is to get tourists to visit Wyoming. It is then the job of the Recreation Commission to make sure there are adequate attractions within the borders. The economic future for tourism is promising. Some of the projects the Commission is undertaking include:

(1) The primary focus of the Commission, on the drawing board now, is dependent on the Legislature's 1990 budget session. The Recreation Commission hopes to secure enough funding to produce a regional/in-state marketing plan for Wyoming recreation. The dollar spent by a Wyoming resident who chooses to spend a three-day weekend in-state is just as valuable as the dollar spent by a Chicago visitor. This kind of marketing plan would supplement the extensive efforts of the Travel Commission.

(2) A logical focus for the Recreation Commission is to promote and develop Wyoming's winter sports. In fact, one of the Centennial projects is to complete a Continental Divide snowmobile trail.

(3) The Recreation Commission will continue to program events which will attract both in-state and out-of-state visitors. An excellent example of a successful event was last summer's Fourth of July bluegrass festival and Mountain Man Rendezvous held at Happy Jack, between Cheyenne and Laramie on I-80. The festival was a perfect example of the private/public partnership which can stimulate the economy. Securing corporate sponsorship from 7-Eleven stores, the bluegrass festival was an economic success. An added benefit was that the event generated over \$4,000 for the Muscular Dystrophy Association. Enticing Wyoming residents from traveling out-of-state on a long weekend can have nothing but a beneficial effect on the economy. A typical visitor could make a three-day loop by attending the bluegrass festival, proceeding to South Pass City's Fourth-of-July Celebration and ending with a visit to the famed Thermopolis hot springs.

(4) Another Centennial project is the Centennial Acre, near Independence Rock. The project encourages people to purchase a square

foot of Wyoming land near Independence Rock, located along the Oregon Trail, for just \$10.00. The proceeds will help fund the Wyoming Centennial Commission's activities and projects for the Wyoming 1990 centennial celebration.

(5) An all-out effort to attract conventions and conferences to Wyoming is being conducted.

Tourism Coordinating Coalition

In 1987, the Tourism Coordinating Coalition (TCC) was created to increase the amount of tourism dollars expended within the State. Members include the Travel and Recreation Commissions; Game and Fish Department; Highway Department; Archives, Museums and Historical Department; and Centennial Commission. Ex-officio members are the Wyoming Council for the Arts and Economic Development and Stabilization Board. The TCC was instrumental in providing brochures describing Wyoming Loop auto tours throughout the State.

The TCC is developing an overall tourism plan for Wyoming. When completed in 1989, the plan will address existing tourism-related businesses and the promotion and marketing of tourist attractions.

Economic outlook for recreation and tourism

The near-term prediction for growth is stable. There will continue to be a gradual increase -- 1-2 percent annually -- in tourist dollars. This increase will jump as the number of tourist attractions increases. As with other industries, economic development of small businesses will make the difference. It is not necessary for Wyoming to attract a Disneyland-size amusement. Numerous small areas of tourism will result in increased tourism dollars. Unlike industries like the minerals industry which is so dependent on outside factors, Wyoming can control its own destiny in recreation and travel. Recreation and tourism can make the difference in the economy. Through expansion of tourist-related attractions and increased promotion, the State will be able to generate increased income to offset the declining minerals royalties. The Legislature has already provided its support for improving the State's image and facilities. With continued support and more partnerships between the public and private sectors, the outlook for tourism is positive indeed.

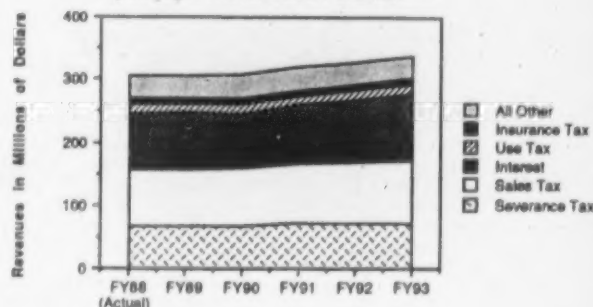
REVENUE AND TAXATION

Revenue

The forecast prepared in October 1988 by the Consensus Revenue Estimating Group (CREG) predicts revenue resources for the FY89-90 biennium to be \$614 million and for the FY91-92 biennium, \$650 million. This growth is attributable to interest income and severance tax, particularly on natural gas. Sales tax, the second largest revenue source of the general fund, is expected to remain fairly flat with a slight inflationary push.

Interest income from the Permanent Wyoming Mineral Trust Fund and pooled investments is the most significant and controllable source of revenue to the general fund. Over the next five years, interest income is expected to provide 30 percent of total revenues.

Wyoming General Fund Forecast



Taxation

Wyoming's tax rates are the lowest in the region and among the lowest in the United States. Wyoming levies neither corporate nor personal income taxes and property taxes are among the lowest in the nation.

The State has been mislabeled as a high taxing state by recent national publications, which rank the states on the basis of total per capita tax collections. These analyses fail to take into account the various components of total tax collections and the large amount of minerals taxes paid by out-of-state producers.

Because of the absence of personal income tax, Wyoming rates second only to Alaska in the lowest relative tax burden of a typical family. Comparative statistics regarding Wyoming's tax structure follow:

(1) Five states have no sales tax. The next group of four - Wyoming, Colorado, Georgia, and North Carolina - impose a 3 percent sales tax rate. Connecticut has the nationwide high of 7.5 percent. One aspect to be addressed before considering an increased sales tax is the argument that sales tax is regressive since it taxes all citizens equally, regardless of income.

(2) Wyoming taxes gasoline at a rate of 8 cents per gallon. Only Georgia is lower, at 7.5 cents. The national average is 14 cents. Wyoming's neighboring states tax gasoline at rates of 18 cents (South Dakota, Colorado, Idaho), 18.7 cents (Nebraska), 19 cents (Utah), and 20 cents (Montana).

(3) Wyoming cigarette taxes are also among the lowest nationwide. Wyoming's 8 cents per package is beaten only by the tobacco producing states of South Carolina, North Carolina, Virginia, and Kentucky. At least twelve states, including two of Wyoming's neighbors (North Dakota and Nebraska) have cigarette taxes of 25 percent or more.

(4) Wyoming is one of only five states with no corporate income tax.

(5) Wyoming imposes no personal income tax.

To lessen the State's reliance on mineral taxes, the Ferrari report (Ferrari, 1988), suggested the State may do well to consider broadening the tax base. Such a move could be beneficial. In fact, the success of economic development measures could be diluted if the State continues its dependence on mineral taxes as a major revenue source. However, given the State's legislative history and mood regarding taxation, it seems highly unlikely that such a measure will be taken.

Earl Kabeisemen, Director of Revenue sees an additional way to potentially increase revenues: the audit. Until last year, the Department of Revenue and Taxation had no auditors on its staff. There are currently three auditors and the department will be asking for authorization to expand the number. The main target will be a mineral audit to ensure that producers are complying with the tax law.

Another option for the Legislature will be to take a long, hard look at the earmarking of funds. Although a change in this process will not create new monies, a study of the process could reveal whether any accounts are overfunded or even underfunded.

ECONOMIC DEVELOPMENT AND DIVERSIFICATION

One of the challenges for Wyoming in the near future will be to focus its development activities. The State must direct its efforts if it is to overcome some of its inherent disadvantages such as location, transportation, low population, and harsh climate. Because of its small population, Wyoming is largely dependent on demands made for its output by non-Wyoming residents. The hope for the future will be connected with the State's ability to unify its economic efforts and promote its products to out-of-state markets.

The Economic Development and Stabilization Board (EDSB) was charged in 1985 with leading Wyoming's economic development efforts. On December 1, 1988, Steven G. Schmitz, former director of the Colorado Division of Economic Development, assumed duties as Wyoming's new economic development director.

Last fall, Governor Sullivan and members of the EDSB conducted five well-attended statewide meetings. The mood is one of overwhelming support for economic development.

Some citizens are cautious in promoting economic development; they don't want to see Wyoming become "another Silicon Valley." They question the trade-offs: diversification and development in exchange for clean air, low population, and low crime rates. However, with the severity of the State's recession, it is clear that some economic development is necessary and enthusiastically supported by the majority of the citizens in the State. It is the goal of the EDSB and others that although the "magic" bywords of "development and diversification" are important, it is equally important to preserve Wyoming's physical environment and lifestyle.

The EDSB is currently finalizing an overall marketing plan for the State. One feature of this plan is an extensive advertising campaign.

Ed Riddell and Associates of Jackson was selected to design and implement the campaign. One objective of the advertising campaign is to increase awareness and interest in Wyoming as a site for relocation or expansion by out-of-state businesses. An equally important goal of the campaign will be to increase awareness and usage of EDSB programs by in-state businesses. The latter objective will be conducted through an extensive newspaper and radio media campaign.

In addition to the in-state advertisements, Riddell's media plan incorporates comprehensive advertising in selected trade publications for the plastics, semiconductors/computers, and data processing/insurance industries. Ads will also be purchased for national business development publications, general trade industry publications such as Industry Week, regional business publications such as Colorado Business and the Salt Lake City Tribune, several sports publications such as the Field & Stream Hunting Annual, and an international publication entitled European Finance: Site Selection in America. A booklet describing Wyoming's business advantages will be offered to businesses with an interest in relocating.

Another feature of the overall marketing plan has been to identify those businesses that have the highest probability of succeeding in Wyoming, including those relocating or expanding from out-of-state and those starting anew. One area of emphasis will be the development of value-added businesses.

The general theme of the diversification projects - whether related to agriculture, technology, tourism, or another industry sector - is that Wyoming's strongest efforts should be to concentrate on smaller companies which are most likely to relocate to Wyoming. Part of the reason for this is that many Wyoming communities are too small to be able to support a major industry.

With the passage of Constitutional Amendment 4, the EDSB was given a direct appropriation of \$15 million over two years for loans and loan guarantees. The loan program started 15 months ago; the most recent loan was made in the summer of 1988. Some of the money has gone to support start-up companies, some to existing businesses wanting to expand. Though it is still early to judge the effectiveness of the program, the preliminary report is positive.

Another program occurring in several communities is the idea of business incubators. The concept is good in that beginning businesses can share fixed expenses until they are stable enough to make it on their own. A successful business incubator program will promote the formation of innovative new businesses. Laramie County Community College (LCCC) has already established a small business incubator on campus.

An industry sector which is reportedly expanding within the State is financial services and insurance. These firms find that Wyoming has an available work force and a favorable business climate away from the hustle and bustle of big metropolitan areas.

One of Wyoming's challenges in attracting new businesses will be to dispel the myths propagated by the national media that Wyoming

has a poor business climate. An acute image problem mentioned earlier occurs when surveys do not separate mineral royalties from the State's total taxation. The October issue of *Inc.* magazine rated Wyoming last among all fifty states when comparing the potential for new jobs, new companies, and the climate for growth. These are perceptions the administrators in Cheyenne must aggressively defeat. One positive note occurred when U.S. WEST purchased full-page ads in the Wall Street Journal, showing Governor Mike Sullivan fishing and proclaiming our low tax rate.

Another challenge in terms of economic development will be to improve transportation systems. On the other hand, Wyoming has the opportunity to attract communications-based industries since five high-capacity, high-speed, nationwide digital network routes will soon traverse the State.

SCIENCE AND TECHNOLOGY

Economic development is absolutely tied to technology. Wyoming must join the technology revolution if it wants to keep pace with the rest of the nation. By 1988, 45 states had developed over 250 programs with combined budgets of \$400 million to stimulate technological innovation. Wyoming has been reported as one of five states that lack programs specifically designed to stimulate technological innovation. This is a bit misleading since the Legislature has generously funded numerous research programs at the University of Wyoming. However, what seems to be lacking is a unified, consistent, and well-funded effort to develop new technologies.

The Wyoming Science and Technology Authority (WSTEA) was established in February 1987 to invest in research and the development of new products and processes in Wyoming. The legislation creating WSTEA authorizes activities in five areas:

- research capability development
- basic research
- applied research
- technology transfer and assistance
- seed capital for development of new products and processes.

Although WSTEA may invest in research and development, it is currently inactive pending funding. Comparable programs in Utah and Montana received \$5.187 million and \$7.1 million respectively from state governments.

The Arkansas Science & Technology Authority (ASTA) is a good example of the measurable advantage a state can gain by promoting science and technology. Since 1985, ASTA has implemented programs in basic and applied research grants, business incubators, and seed capital investment. The three technology-based businesses in which ASTA invested \$425,000 in seed capital have already created 44 jobs and leveraged \$1.3 million from other sources. ASTA's incubators and their 14 tenant firms employ 81 people. ASTA's investment of almost

\$1.3 million in 38 basic and applied research projects has the potential of creating or saving up to 4,400 jobs while adding more than \$225 million annually to the economy.

On a much smaller scale, Wyoming has funded several programs to promote research efforts with the potential of diversifying the economy. For example, twenty-two basic and applied research projects - including topics as diverse as coal drying processes, development of a microbial preservative for beef, archaeological site development, and resin transfer molding systems - at the University of Wyoming have received State funding. In addition, the State supports programs at UW including the Enhanced Oil Recovery Institute, the Wyoming Water Research Center, and the Wyoming Center for Energy Research.

There is a clear connection between technological research and economic development. Basic research leads to applied research which can, in turn, lead to the development of a prototype. If the prototype is successful, the innovator will consider commercial production, marketing and distribution and will, finally at the end of this chain, provide an economic impact. The State could make great strides by supporting any or all of these steps between basic research and economic impact. It seems obvious, therefore, that if the State is successful in stimulating new technological developments, its attempts at economic diversification will be greatly enhanced.

SUMMARY

There is no quick fix or overnight solution to economic problems that have taken years to develop. Because of Wyoming's historic reliance on the mineral industry, international economic conditions have had a particularly potent effect on the economy. Wyoming can no longer afford to put most of its eggs into the "minerals" basket. Nor can it ignore the traditional industries. A happy medium between diversification and traditional industries must be reached in order to enhance the economic picture. A continued reliance on mineral revenues will not return Wyoming to a healthy economic position; diversification is unquestionably necessary.

Wyoming's near-term outlook is for gradual improvement in the current situation. Unlike the situation in the early 1980's when the performance of the Wyoming economy was superior to the U.S. economy, it is likely now that the reverse will be true for some time. If the efforts at diversification and development are unified and allowed to flourish, the long-term outlook will be more positive.

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Kathie Cuomo

**RETIREMENT
AND RELOCATION**

Financial Retirement Planning and Projected Relocation Behavior of University of Wyoming Employees

Introduction

Since less than five percent of Americans report adequate financial planning for retirement (Schulz, 1985), planning for the financial aspects of retirement is one of the most important tasks facing individuals. University of Wyoming employees are no exception to this financial reality. However, as employees of a land-grant university, they are faced with an interesting situation. Some financial planning for retirement is performed by the state through participation in the Social Security system and various retirement programs. Simultaneously, individuals are expected to augment their retirement funds through additional prudent planning, savings, and investments. This article reports on research examining the financial retirement planning behavior of university faculty and staff.

For many individuals the process of retirement involves a move and relocation. This is one of fundamental reasons for the growth of the Sunbelt region as our nation ages (Golant, 1979). It is important to Wyoming's economic stability that individuals and families remain in the area when they retire. A second goal of this article is to examine whether or not University of Wyoming employees plan to remain in Albany county and Wyoming upon retiring or relocate to some other part of the United States.

Method

The University of Wyoming participated in a regional study entitled "Housing and Locational Decisions of the Maturing Population: Opportunities for the Western Region (W-176)" funded by eight Agricultural Experiment Stations of land-grant universities in the West and Missouri. In October, 1987, over 1000 questionnaires were mailed to professional and nonprofessional employees of the University of Wyoming over 40 years of age. Over 60 percent of the questionnaires were returned completed resulting in a total sample of 603 respondents.

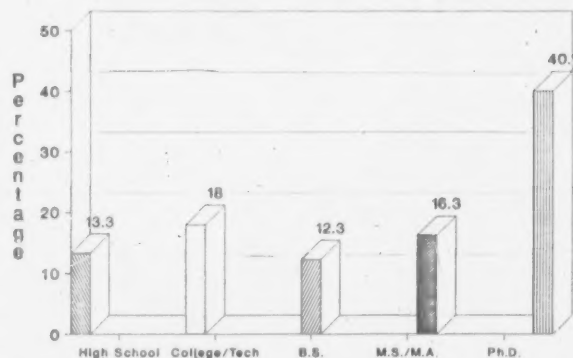
Sample

The sample consisted of 352 males (58 percent) and 252 females (42 percent). The respondents were divided into five age groups--40 to 45 year olds (n=202), 46-50 year olds (n=167), 51 to 55 (n=95), 56 to 60 (n=96) and 61 and above (n=39) with the median age of 49. Although this was a relatively young sample, the median date for expected retirement was reported as the year 2000. One hundred twenty-six of the sample were single (22 percent) whereas 472 (78 percent) were married. The respondents perceived that they were healthy

as a group with more than 96 percent indicating excellent or good health.

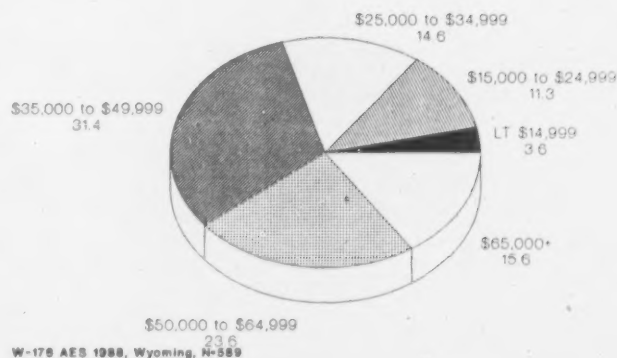
The respondents were classified into the seven E.E.O.C. categories. Certain categories were over-represented in the data. Sixty-six percent of the respondents were in the administration, faculty, and professional classification, 23 percent were clerical and technical staff while 10 percent of the respondents were from the skilled craft and maintenance categories. As a result, the respondents as a whole were highly educated and had above average family income.

Educational Attainment



W-176 AES 1988, Wyoming, N=584

Family Income 1986



W-176 AES 1988, Wyoming, N=589

Measures

Respondents completed specific demographic information. There were 13 questions related to actions taken in retirement planning and 14 regarding expected sources of retirement income. In addition, the respondents were asked if they planned to move from the community and Wyoming. They were also asked where they expected to relocate for their retirement if they planned to move. In addition, respondents were asked the importance of specific community characteristics in their choice of a community in which to spend their retirement years.

Financial Action Plans

The respondents were asked to recall actions conducted in preparation for retirement planning, to project what actions they would take by 1990, after 1990, or if they had no plans related to preparation for retirement in a specific area. These 13 actions were reported in four categories. Table 2 summarizes their responses.

Table 2: Actions in Planning for Retirement

	Have Done	Plan to Do Before	Plan to Do After	No Plans to Do
FINANCIAL ACTIONS				
Savings Account	75.0%	12.1%	5.5%	7.4%
Estate Planning	36.2%	20.6%	18.9%	23.6%
Make a Will	57.4%	30.8%	6.5%	5.4%
EMPLOYMENT ACTIONS				
Obtained a job near retirement location	14.6%	6.9%	21.0%	57.4%
Explored for jobs at retirement location	4.2%	9.6%	32.1%	54.0%
Retrain for new employment	2.7%	4.4%	7.6%	85.3%
HOUSING ACTIONS				
Move to home suited retirement	73.0%	7.6%	32.2%	53.0%
Buy acreage or lot for retirement	15.2%	7.4%	14.1%	63.1%
Buy a second home	9.2%	3.0%	9.4%	78.4%
Buy a recreational vehicle	8.4%	4.7%	13.3%	73.4%
Compare taxes at two or more locations	12.9%	10.9%	35.1%	41.0%
Explore a reverse mortgage (RAM)	1.7%	5.0%	6.7%	86.6%
Explore home equity conversion	4.1%	6.6%	10.5%	78.8%

The actions related to preparation for retirement cluster into three areas. The first was financial and estate planning behavior such as establishing a savings investment plan for retirement income or writing a will (3 items). The second was related to employment after retirement, such as retraining for new employment (3 items). The third was preparation for changes in housing (7 items). While some of the behaviors appeared to be a combination of both financial and housing such as exploring home equity conversion, these behaviors were classified as clearly as possible in one of the above categories.

Overall, each of these areas had a wide variety of reported actions and projected actions. Responses in the area of financial preparation for retirement indicated considerable activity on the part of most respondents with 75 percent of the respondents having established a savings plan for retirement to a low of 36 percent having started estate planning. Both of these behaviors are usually deemed a part of retirement planning for most individuals at some point in the planning process. In the area of housing, less action had occurred with 15 percent having purchased acreage or a lot for retirement to a low of less than two percent having explored a reverse mortgage (RAM). Unlike the financial actions previously discussed, these behaviors are not necessarily a universal expectation for retirement planning. Diversity was also found in job related retirement planning behavior. Some of the respondents reported that they had already obtained a job where they planned to retire (15 percent) while only four percent reported having trained for new employment after retirement.

There were numerous intervening variables that may account for these individual differences between responses. Further analysis of the data from both Wyoming and the employees of the other eight land grant universities will examine this issue in a future report.

Sources of Planned Retirement Income

Respondents were asked to project the sources of retirement income for their family. The potential retirement income could be generated by either themselves, their partner/spouse, or by both. The responses were classified using three categories, yes, no, or don't know. Table 3 represents a summary of these responses.

The 14 potential sources of retirement income were grouped into three broad categories. The first was income derived from pension programs established by either the federal government or by employers or by current part or full-time employment. The second was income that generally results from investments that required financial planning behavior related to the future, such as savings, individual

retirement accounts (IRA), annuities, and paid-up life insurances. There were eight of these potential sources. The third category was retirement income that was difficult to classify except as "other" since it was derived from relatives or public assistance.

As could be predicted, most respondents (97 percent) expected to receive either Social Security and/or a pension from their employers upon retirement. Less than five percent of the respondents and their families expected to receive a military pension upon retiring. The results regarding part- or full-time employment were mixed with 41 percent stating it would be a source while 39 percent did not know if it would be a source or not.

Table 3: Sources of Family Retirement Income

	Yes, A Source	No, Not A Source	Do Not Know
<u>PROVIDED BY PRESENT OR PAST EMPLOYMENT</u>			
Social Security	96.8%	1.8%	1.3%
Pension plan sponsored by state/employer	96.7%	1.7%	1.0%
Military pension	4.6%	92.4%	3.0%
Employment (part or full time)	41.1%	19.5%	39.4%
<u>PERSONAL OR FAMILY FINANCIAL ACTIVITIES</u>			
Savings (passbook, CD, savings bonds)	79.9%	14.0%	6.1%
Individual Retirement Accounts (IRA)	68.4%	23.1%	8.6%
Mutual funds	39.0%	44.0%	17.0%
Stocks and/or bonds	38.9%	43.7%	17.3%
Income from property ownership	36.2%	42.9%	20.4%
Sale of real estate	35.3%	34.4%	30.3%
Annuities	51.4%	34.6%	14.0%
Paid-up life insurance	45.3%	41.8%	12.9%
<u>OTHER SOURCES OF INCOME</u>			
Family or relatives	6.3%	81.9%	11.8%
Public assistance	1.0%	84.0%	15.0%

The second form of retirement income generally required planning and investment behavior. Savings accounts and individual retirement accounts (IRA) were the most expected sources of these retirement incomes (80 percent and 68 percent respectively). Almost equal numbers of respondents report that they would have annuities and paid-up life insurance as retirement income (51 percent and 45 percent). In addition, almost equal numbers of respondents have purchased other financial planning products

(39 percent mutual funds and 39 percent stocks and/or bonds) for retirement income. Income from the sale of property and from property ownership were also similar with 36 percent and 35 percent having these as potential sources of retirement income.

The other sources of retirement income were difficult to evaluate as a group since each has unique features. Very few of the total group of respondents expected either support from their families or friends (six percent) or public assistance (one percent). However, 12 percent and 15 percent of the respondents reported they do not know if these will be sources of income.

Additional statistical analysis will be conducted in the future in order to determine the relationship between sources of family retirement income and demographic characteristics.

Relocation During Retirement

The respondents were asked a series of questions regarding where they expected to live upon retirement. Three of these questions related to whether they planned to move from Albany county and Wyoming and if they planned to stay in one location while retired. Slightly more than half of respondents (53 percent) reported they either strongly or somewhat strongly preferred to remain in Albany county while 48 percent reported that they strongly or somewhat strongly preferred to live somewhere else upon retirement. A similar question stated that "all things considered, how likely are you to move away from your present community when you retire." Forty-six percent reported that it was very or somewhat unlikely that they would move from Albany county while 54 percent responded it was somewhat likely or very likely, they would move upon retirement. These results suggested that the sample was almost equally divided as to their decision on remaining in Albany county upon retirement. These findings indicate a further potential decline in population and economic stability for Albany county in the next 15 years if half of the retirees from the University of Wyoming leave Albany county upon retirement.

Participants were also asked to describe the characteristics of the community in which they would most like to spend their retirement years. Most described a county population ranging from 10,000 to 49,999 (50 percent) or a slightly larger population ranging from 50,000 to 149,999 (28 percent). Within that county, most indicated that they would like their residence to be in a smaller town (37 percent) or in a rural community within 20 minutes of the city (31 percent). The majority of the sample (77 percent) indicated a preference to remain in a detached single family dwelling for their retirement years. When that was not an option, most (45 percent) preferred to live in a

townhouse. The least preferred housing choice for the retirement years was a recreational vehicle. Thirty-nine percent indicated that this was not an option they would choose, a challenge to the myth that individuals look forward to retirement so they can spend the rest of their years travelling across the country in their recreational vehicle.

In their choice of a retirement community, most respondents indicated that cost of living and cost of utilities were important considerations. Forty-three percent indicated that low cost of living was very important while another forty-eight percent reported it to be somewhat important. Low utility rates were very important to 43 percent of the respondents and somewhat important to another 47 percent. Medical, recreational, and library facilities were also important to the respondents in considering their retirement community. Sixty-two percent of the respondents reported that medical facilities were very important to their decision while 33 percent indicated that they were somewhat important. A total of 85 percent of the sample reported that recreational facilities were either very important or somewhat important in their decisions regarding their retirement community. This seems to be a particularly high percentage but may again be reflective of the specialized population of the respondents. Library facilities were very important to 46 percent of the sample and somewhat important to 38 percent of the respondents. This finding could be reflective of the educational level of the sample population whose professional lives have encouraged them to use library facilities as a continuing part of their professional development.

Other factors one might expect to be important were found to be somewhat less significant to the retirement community decision than expected. The availability of public transportation was somewhat important to 39 percent of the sample but was not too important to 30 percent of the respondents. Although shopping has been reported to be an important recreational activity by many elderly, the availability of a shopping mall was somewhat important to 40 percent of the sample but not too important or not at all important to another 38 percent. The availability of employment opportunities was somewhat important to 34 percent and not too important or not at all important to 50 percent of the respondents. Convenient air transportation was somewhat important to 43 percent but not too important or not at all important to 34 percent of the respondents. Most of the respondents (90 percent) indicated they would prefer a community that included individuals of all ages in their first ten years of retirement. After the first ten years, the majority (66 percent) indicated they would still prefer a community with

individuals of all ages while 29 percent suggested they would prefer to live among mostly older people after their first ten years in retirement.

The desired community characteristics described above are important for Wyoming communities to be aware of as they attempt to attract and maintain individuals and their families as they retire from the University of Wyoming. Awareness of these needs and desires, many of which are possible for some Wyoming communities, may assist community leaders and planners as they consider attracting retirees to their communities as a positive alternative for economic development.

Many of the preferred geographical characteristics are readily available in Wyoming. Table 4 presents respondents' preferences for specific geographic characteristics of their retirement environment.

Table 4: Geographic and Climatic Preferences

	Prefer	Neutral	Do Not Prefer
Near Ocean	38%	41%	21%
Near lake/river	74%	21%	5%
Near mountains	88%	10%	2%
Low altitude	20%	55%	25%
Snow in winter	38%	28%	34%
Low humidity	74%	18%	8%

Studies indicate that numerous affluent and well educated retirees live in a variety of locations on an annual basis upon retirement (Blank, 1982). This sample, which had both above average income and education, reaffirmed those previous studies with only 38 percent planning to live in the same location all year. Of those planning to live somewhere else for part of each year, an equal number (26 percent each) reported they plan to live in the same general location each year or in a different general location each year. Ten percent of the respondents planned to live at a variety of locations for part of each year of their retirement. This movement of large numbers of retirees on an annual basis could be expected to have an impact on the local economy of Albany county.

The respondents were asked where they would prefer to retire for the first ten years of retirement if they could retire anywhere in the United States. Forty-eight percent of the respondents reported that they preferred Wyoming in the first ten years of their retirement. Other states that could economically benefit from the relocation of Wyoming retirees were Colorado (11 percent), Arizona (9 percent), California (5 percent), New Mexico (5 percent),

California (5 percent), New Mexico (5 percent), Oregon (3 percent), and Hawaii (3 percent). When respondents asked the second most preferred state for retirement, there were changes in the responses. The most preferred state became Colorado (18 percent) followed by Arizona (14 percent) and Wyoming (14 percent).

These results suggest that the majority of University of Wyoming employees plan to move from Wyoming upon retirement. Further analysis of the data will indicate the profile of those individuals. However, it is apparent that if Wyoming is going to maintain its population base and its economic stability efforts must be made to retain university personnel and their families within the state.

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**ECONOMIC
CHANGES**

ECONOMIC CHANGES

(Editor's note: The purpose of this section is to point out areas of Wyoming's economy in which noteworthy changes occurred or in which existing trends were significantly accentuated, during the latest reporting period.)

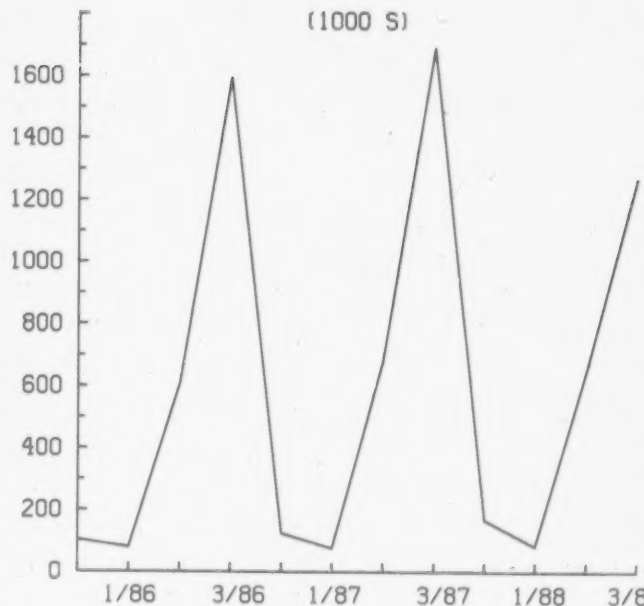
Statistics related to the Yellowstone tourism, business failures, and value of business failures are among the highlights in the Update's third quarter 1988 figures.

The number of Wyoming business failures continued to decline, from 52 in second quarter 1988 to 34 in third quarter 1988.

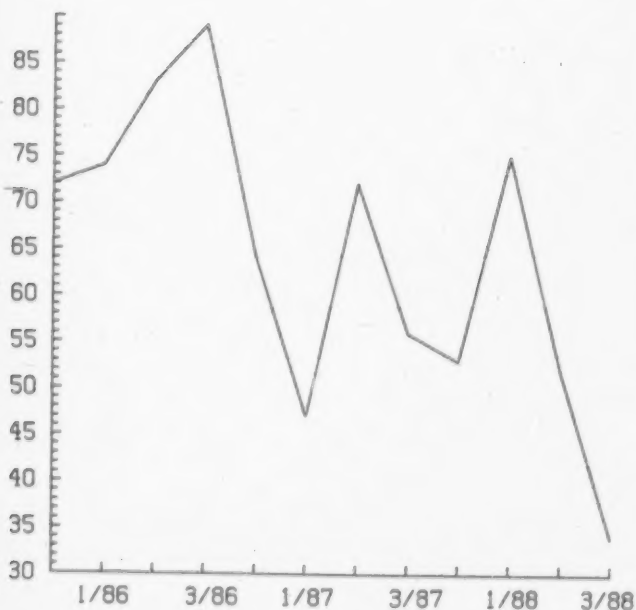
The sharp rise in the value of business failures, from \$3,906,790 in the second quarter to \$28,339,510 in the third quarter of 1988, was due mainly to the bankruptcy of one large partnership.

Tourism at Yellowstone and Grand Teton National Parks suffered from the effects of the forest fires in third quarter 1988. Comparing third quarter 1988 to third quarter 1987 the number of tourists at Yellowstone was down 424,548. However, the effect of the forest fire was not entirely devastating to Park and Teton counties. Sales and use tax revenue rose 47 percent in Teton County and 16 percent in Park County in the third quarter of 1988 vs. the third quarter of 1987.

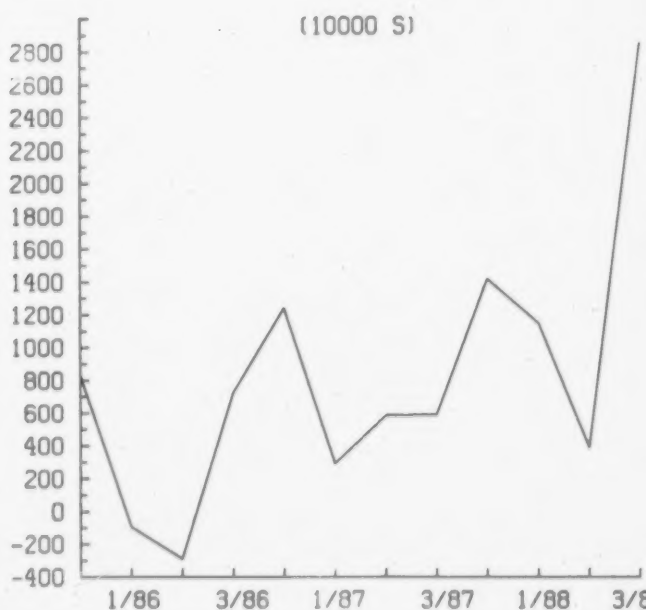
Yellowstone



Business Failures



Value of Failures



**WYOMING
DATA**

Table 5: Agriculture¹

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. Timber Cut in Wyoming National Forests (MBF)	57834.	27236.	10067.	10867.	42510.	47783.	25572.	20299.	75482.	28080.	5860.	39416.
Price Indices ² (1967=100)												
2. Wyoming Crops, Prices Received-Latest	248.	241.	222.	216.	208.	204.	209.	229.	208.	209.	236.	319.
3. Wyoming Crops, Prices Received-Average	252.	245.	232.	219.	215.	206.	207.	230.	208.	208.	221.	303.
4. U.S. Crops, Prices Received-Latest	226.	214.	209.	187.	190.	192.	210.	266.	220.	211.	249.	265.
5. U.S. Crops, Prices Received-Average	220.	214.	216.	195.	191.	192.	203.	223.	217.	214.	228.	263.
6. Wyoming, All Commodities, Prices Received-Latest	222.	236.	224.	248.	235.	261.	263.	304.	273.	296.	275.	301.
7. Wyoming, All Commodities, Prices Received-Average	231.	237.	233.	241.	241.	260.	268.	283.	279.	287.	288.	283.
8. U.S. All Commodities, Prices Received-Latest	233.	223.	222.	223.	220.	222.	237.	235.	234.	237.	253.	265.
9. U.S., All Commodities, Prices Received-Average	229.	224.	222.	227.	223.	222.	233.	234.	236.	238.	245.	263.
10. Wyoming Livestock, Prices Received-Latest	215.	235.	225.	257.	242.	278.	280.	327.	292.	322.	287.	295.
11. Wyoming Livestock, Prices Received-Average	225.	235.	233.	247.	248.	276.	286.	300.	300.	310.	308.	277.
12. U.S. Livestock, Prices Received-Latest	240.	231.	234.	256.	247.	249.	261.	201.	248.	260.	258.	267.
13. U.S. Livestock, Prices Received-Average	239.	233.	229.	255.	251.	250.	242.	241.	253.	260.	261.	264.
14. Prices Paid by U.S. Farmers-Average	330.	324.	326. ³	324.	321.	327.	331.	336.	335.	339.	348.	352.

¹First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.

²The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

³This figure is for the month of April. This index is now reported in the months of January, April, July, and October.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics.

Table 6: Banking and Finance

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. Total Bank Loans and Leases Financing Receivables (T\$)	2226477.	2173437.	2108551.	2066324.	2003375.	1932753.	1931400.	1779168.	1765203.	1733754.	1787542.	1777474.
2. Total Bank Deposits (T\$)	4048702.	3908134.	3797038.	3787785.	3912276.	3741328.	3740737.	3688191.	3792473.	3671572.	3705311.	3712403.
3. Total Non-Interest-Bearing Deposits (T\$)	689811.	624421.	620064.	611410.	638317.	559803.	591011.	582741.	603809.	531243.	564608.	572367.
4. Savings and Loan Mortgage Loans (T\$) ¹	929668.	826697.	817750.	811230.	787910.	810354.	812614.	794162.	772721.	744492.	740954.	726300.
5. Savings and Loan Deposits (T\$)	1166220.	1139851.	1137374.	1137155.	1148406.	1120110.	1104107.	1104332.	1137196.	1119558.	1107268.	1107961.
6. Prime Interest Rate ²	9.50	9.10	8.50	7.50	7.50	7.50	8.25	8.70	8.75	8.50	9.00	10.00

¹Only members of the Federal Home Loan Bank Board are included. Indicates amount at the end of the quarter.

²Prime rate charged by banks on short-term business loans. Rate is for last month of the quarter.

Sources: Series 1-3: Office of the State Examiner of Wyoming, Abstract Report of State and National Banks in Wyoming, Published Quarterly.
 Series 4 and 5: Federal Home Loan Bank of Seattle, Monthly Report. Comparative statistical analysis of member institutions.
 Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 7: Business Conditions

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. New Domestic Corporations	283.	308.	301.	262.	307.	256.	270.	267.	254.	300.	298.	246.
2. New Foreign Corporations	217.	251.	223.	189.	217.	206.	232.	259.	229.	208.	196.	208.
3. Total New Corporations	500.	559.	524.	451.	524.	462.	502.	526.	483.	508.	494.	454.
4. Business Failures	72.	74.	83.	89.	64.	47.	72.	56.	53.	75.	52.	34.
5. Value of Business Failures (\$)	8266910.	-933393. ¹	-2898465.	7242872.	12405831.	2935220.	5896578.	5918282.	14181020.	11499022.	3906790.	28339514.
6. Personal Bankruptcies	211.	238.	321.	288.	340.	333.	359.	301.	308.	271.	351.	306.

¹Assets exceed liabilities.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.

Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 8: Construction

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. New Residential Dwelling Units	511.	287.	544.	494.	317.	270.	458.	744.	462.	317.	449.	339.
2. Value of Residential Dwellings Constructed (M\$)	33.9	19.5	33.4	33.0	21.6	17.6	34.2	59.4	34.7	24.4	37.3	28.8
3. Value of Nonresidential Construction (M\$)	17.1	14.2	38.7	51.3	9.2	6.8	39.7	23.0	18.2	2.8	35.2	7.0
4. Building Permits Issued in Selected Wyoming Cities	2872.	2547.	3979.	3698.	2112.	1015.	2841.	3953.	2451.	1489.	2763.	2220.
5. Value of Authorized Construction (T\$)	15695.	21484.	49454.	38669.	20453.	9083.	23444.	24258.	13633.	15559.	25330.	21878.
6. Mortgage Interest Rate ¹	10.47	10.01	9.74	9.74	9.43	8.77	9.05	9.03	8.78	8.77	8.72	8.90

¹Conventional first mortgage for new home purchase. U. S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Local Construction Potentials." Published monthly.
 Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.
 Series 6: U. S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 9: Consumers

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. New Truck Registrations	3915.	3343.	3650.	3951.	2993.	2253.	3155.	3011.	3391.	2867.	3508.	3203.
2. New Car Registrations	3177.	3200.	3804.	4181.	2784.	2211.	3171.	3332.	3027.	2736.	3147.	2969.
3. Wyoming Personal Income (M\$)	6645.	6838.	6599.	6265.	6116.	6103.	6288.	6240.	6292.	6284.	6444.	INA
4. U.S. Disposable Income (B\$)	2846.	2935.	3010.	3038.	3062.	3126.	3147.	3225.	3316.	3376.	3421.	3499.
5. U.S. Personal Income (M\$)	3390795.	3451458.	3507381.	3537172.	3589561.	3663685.	3721716.	3785589.	3901510.	3923680.	4003548.	INA
6. Latest U.S. Consumer Price Index (1982-1984=100) ¹	323.4	321.4	323.0	324.9	325.7	111.0 ²	112.4	113.8	114.2	115.1	116.7	118.5
7. Quarter's Average U.S. CPI	322.4	323.0	321.6	327.1	325.4	110.5 ²	112.0	113.3	114.2	114.8	116.7	117.8
8. Liquor Sales (T\$)	9526.	6293.	7500.	8334.	8811.	5421.	6673.	7616.	8379.	5679.	6714.	7041.

¹Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers.

²Beginning January 1987, the consumer price index, previously expressed on a base of 1967=100, has been rebased to 1982-84=100. Selection of the 1982-84 period was made to coincide with the updated expenditure weights, which are based upon data tabulated from the Consumer Expenditure Surveys for 1982, 1983, and 1984. Historical data on the new base or additional information regarding these changes is available from the Bureau of Labor Statistics, Washington, D.C. 20212.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
 Series 3,4: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published quarterly.
 Series 4,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
 Series 8: Wyoming Liquor Commission. Sales data are reported to IPR.

Table 10: Employment and Labor¹

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. Civilian Labor Force	246570.	243710.	253139.	255514.	243637.	238819.	248444.	242054.	236588.	227571.	233949.	235003.
2. Employment	228368.	220575.	230952.	235065.	221405.	209316.	226738.	225635.	219767.	208257.	220780.	223829.
3. Unemployment	18203.	23135.	22187.	20449.	22233.	29503.	21707.	16419.	16821.	19315.	13168.	11174.
4. Unemployment Rate	7.4	9.5	8.8	8.0	9.1	12.4	8.7	6.8	7.1	8.5	5.6	4.8
5. Initial Claims Filed	12467.	15095.	13146.	11710.	14560.	13392.	8086.	6386.	9983.	10949.	6888.	5376.
6. Applications Received	11347.	14321.	14968.	13057.	10542.	10013.	11276.	9067.	9470.	INA	INA	INA
7. New Non-Agricultural Openings	9685.	7059.	10595.	10997.	7408.	4872.	9615.	9532.	8342.	INA	INA	INA
8. New Non-Agricultural Placements	9163.	6348.	8490.	8869.	7149.	4182.	8020.	7117.	8061.	INA	INA	INA
9. Miners' Average Weekly Hours	44.2	44.2	42.0	42.0	42.7	40.9	40.8	42.7	44.5	42.2	44.1	43.7
10. Miners' Average Weekly Pay (\$)	606.18	610.74	609.92	609.39	627.13	599.03	602.91	605.87	620.90	625.04	649.91	640.19
11. Miners' Average Hourly Wage (\$)	13.72	13.83	14.53	14.51	14.68	14.66	14.79	14.19	13.94	14.80	14.75	14.65

¹The most recent year's data are preliminary.

Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published monthly.

Table 11: Energy and Mineral Production

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. Wyoming Coal (TST)	31515.	34323.	30093.	34406.	36350.	35184.	33887.	39261.	38077.	40228.	40802.	41355.
2. U.S. Coal (TST)	220701.	226592.	222359.	215298.	222291.	222892.	219022.	226784.	243034.	237128.	230464.	241952.
3. Wyoming Oil (TBPB)	347.	340.	330.	327.	317.	310.	302.	310.	298.	300.	302.	309.
4. U.S. Oil (TBPB)	8960.	9052.	8815.	8505.	8390.	8371.	8339.	8227.	8191.	8329.	8301.	8185.
5. Wyoming Natural Gas (MMCFD) ¹	1204.	1404.	1243.	888.	1692.	1453.	1281.	1171.	1203.	1430.	INA	INA
6. U.S. Natural Gas (MMCFD)	47757.	48251.	44326.	43457.	46953.	50801.	45830.	44335.	49241.	50768.	46453.	INA
7. Active Rig Counts in Wyoming-Average	96.	57.	25.	22.	38.	23.	27.	47.	61.	40.	33.	43.

¹Beginning with fourth quarter 1986, Wyoming gas includes carbon dioxide production.

Sources: Series 1,2,5, and 6: U. S. Department of Energy. Energy Data Reports. Gas data are from Natural Gas Monthly, and the Wyoming Oil & Gas Conservation Commission. Coal data are published weekly.

Series 3-4: The Oil and Gas Journal. U.S. and Wyoming Oil Production. Published weekly.

Series 7: Petroleum Information Corporation, Hughes Tool Company. Monthly Average Active Rig Counts in Wyoming.

Table 12: Government

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. Sales and Use Tax Collections (T\$)	65957.	53816.	47695.	55716.	51058.	39867.	39591.	44922.	47115.	42585.	42769.	49721.
2. Violent Crime ¹	319.	292.	380.	374.	269.	299.	325.	435.	354.	354.	371.	431.
3. Nonviolent Crime ²	4212.	4294.	5485.	5265.	4294.	3955.	4772.	5057.	4420.	3713.	4562.	4662.
4. Stolen Property (T\$)	2447.	2529.	3713.	2420.	2222.	1880.	2342.	2494.	2199.	1770.	1986.	2467.
5. Stolen Property Recovery Rate	41.0	34.2	54.0	38.6	31.0	41.4	35.7	33.1	34.1	42.2	43.1	35.5
6. Percent of Crimes Cleared ³	28.9	28.2	24.7	25.2	36.4	32.0	26.6	44.2	34.5	33.7	28.3	30.9

¹Murder, negligent homicide, forcible rape, robbery, aggravated assault.

²Burglary, larceny, auto theft.

³Clearance of a crime indicates resolution of a complaint by arrest or other extraordinary means.

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and Use Tax Division. "Net Collections by Business Class by County." Published monthly.

Series 2-6: Uniform Crime Reporting Center for Criminal Justice Research, Division of Criminal Identification, Office of the State Attorney General. "Crime in Wyoming." Published quarterly.

Table 13: Tourism

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
<u>Visitors, National Parks and Monuments</u>												
1. Yellowstone	103487.	79077.	607923.	1593749.	124314.	75835.	681163.	1692818.	168613.	83736.	649842.	1268270.
2. Grand Teton	181840.	138794.	530991.	1314373.	196051.	141570.	535659.	1486479.	264932.	144982.	624400.	1083754.
3. Devil's Tower	12157.	9237.	86167.	186134.	16610.	8523.	92700.	215299.	17980.	7121.	109993.	222877.
4. Fossil Butte	1213.	205.	4367.	10105.	1152.	282.	5082.	13793.	1072.	286.	5894.	13838.
5. Fort Laramie	3921.	2027.	28120.	52465.	3863.	1305.	35117.	50167.	4437.	1172.	24384.	49631.
6. Big Horn NRA-South ¹	46073.	18574.	53634.	65696.	40878.	22056.	55064.	70305.	40782.	30045.	60727.	58820.
<u>Other Tourism Indicators</u>												
7. Traffic Count (Avg. number of Vehicles/Day)	98463.	90397.	119613.	147829.	91685.	78349.	116920.	163546.	113385.	88529.	142830.	178675.
8. Hotel, Motel, and Camp Sales Tax (T\$)	1370.	862.	1185.	2205.	1364.	928.	891.	1821.	1871.	947.	1050.	2106.
9. Gasoline Sales (TGL)	74304.	62891.	76603.	95902.	68488.	56561.	79620.	98146.	71190.	62295.	81811.	INA

¹ Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
 Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
 Series 8: Wyoming Department of Revenue and Taxation. "Sales and Use Tax Summary by County by SIC Major and Minor." Reported monthly.
 Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 14: Utilities¹

Calendar Quarters	4/85	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88
1. Residential Electric Connections	179609.	179931.	179179.	177718.	177613.	177091.	176113.	175745.	175879.	175896.	176333.	177122.
2. Residential Electric Consumption (TKWH)	510291.	502703.	342033.	300186.	408558.	476965.	337943.	291941.	399068.	505669.	351036.	301098.
3. Commercial Electric Connections	33603.	33606.	33885.	33786.	33880.	33355.	33744.	33898.	33780.	33602.	33722.	33846.
4. Commercial Electric Consumption (TKWH)	512748.	499198.	425035.	418211.	486495.	438712.	403123.	419465.	416675.	456190.	420630.	425495.
5. Industrial Electric Connections	2872.	2927.	2811.	2884.	2655.	2989.	2791.	2796.	2764.	2760.	2748.	2921.
6. Industrial Electric Consumption (TKWH)	2626516.	1514740.	1313271.	1452583.	1708946.	1718924.	1587866.	1740306.	1819191.	1788103.	1815370.	1720051.
7. Other Connections ²	3112.	3451.	3285.	3317.	3030.	2801.	3201.	3195.	2680.	2965.	3690.	3899.
8. Other Consumption (TKWH)	10970.	11110.	41061.	66445.	55088.	47998.	51328.	84447.	16355.	10451.	24283.	64994.
9. Residential Natural Gas Connections	75826.	76146.	75383.	74548.	75188.	75206.	74384.	73512.	72654.	74286.	73935.	90673. ³
10. Residential Natural Gas Consumption (MCF)	3018677.	3860776.	1833160.	1013300.	2661644.	3840399.	1944656.	740699.	2274494.	4310738.	2042533.	826220. ³
11. Commercial Natural Gas Connections	6737.	10926.	6651.	6545.	6623.	6652.	6617.	6546.	6520.	6643.	6560.	8357. ³
12. Commercial Natural Gas Consumption (MCF)	1389474.	1890077.	1760704.	398174.	1125927.	1687452.	939284.	408459.	997247.	1939461.	957241.	475106. ³
13. Industrial Natural Gas Connections	93.	91.	91.	91.	95.	98.	93.	88.	87.	88.	90.	90.
14. Industrial Natural Gas Consumption (MCF)	3060300.	2914089.	1885998.	1309870.	1770920.	1129556.	601308.	508551.	828532.	3249154.	482088.	2324709.
15. Other Natural Gas Connections	42.	42.	40.	38.	37.	37.	37.	38.	101.	39.	36.	35.
16. Other Natural Gas Consumption (MCF)	221.	216.	1136.	5478.	132.	170.	1225.	7352.	6988.	12922.	1920.	7488.

¹ Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

² "Other" includes agriculture, municipal, and other public.

³ Starting with third quarter, 1988, the figures for Residential and Commercial Natural Gas Connections and Residential and Commercial Natural Gas Consumption reflect the merger of Northern Gas Division, Northern Utilities Division, and Northern Mountain Gas Company now doing business as Northern Gas of Wyoming.

Sources: Series 1-16: Reports to IPR by selected electric and natural gas utility companies. Survey conducted monthly.

FORMAT

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 3rd quarter of 1985, and end with the 2nd quarter of 1988. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Quarters are calendar quarters. For example, the 2nd quarter is composed of April, May and June. In the table headings and narratives, a particular quarter will be indicated by notation such as 3/85 (3rd quarter, 1985), 4/85 (4th quarter, 1985), and so on.

Beside each data series name is an abbreviation in parenthesis. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the State unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronym "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from IPR. A list of sources follows the footnotes.

Key to Units Abbreviations

MBF - Thousand Board feet

CWT - Hundred Weight

KWH - Kilowatt Hours

ST - Short Tons

TKWH - Thousand Kilowatt Hours

HST - Hundreds of Short Tons

\$ - Dollars

TST - Thousands of Short Tons

H\$ - Hundreds of Dollars

\$/ST - Dollars Per Short Ton

T\$ - Thousands of Dollars

HBBL - Hundreds of Barrels

M\$ - Millions of Dollars

TBPD - Thousands of Barrels Per Day

B\$ - Billions of Dollars

MCF - Thousands of Cubic Feet

GL - Gallons

HMCF - Hundreds of MCF Per Day

TGL - Thousands of Gallons

MMCFD - Million Cubic Feet Per Day

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Census Retrieval Information Service

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Laramie, WY 82071
(307) 766-5141

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Emerson Building
Cheyenne, WY 82002
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U. S. Census information for Wyoming is handled by the Census Retrieval Information Service (CRIS). CRIS serves as the U. S. Bureau of the Census State Data Center and responds to specific information requests. Data from the 1980 Census of Population and Housing is available as well as more current information on population, housing, agriculture, construction, government, and economic topics.

In a recent news release the Census Bureau announced that they and the Office of Management and Budget have agreed on the number of households to be sampled in the 1990 census and on which questions to ask on the census forms. Under the agreement, some 17.7 million housing units will receive a long form in 1990 out of an estimated total of 106 million units. The questions are designed to produce quality statistics for all segments of the population including the elderly, low income workers, Blacks, Hispanics, those of Asian and Pacific Island descent, American Indians, and Alaska Natives.

SUBJECTS PLANNED FOR THE 1990 CENSUS OF POPULATION AND HOUSING

100-Percent Component

<u>Population</u>		<u>Housing</u>	
Name	Age	Number of units in structure	Tenure
Household relationship	Marital Status	Number of rooms in unit	Congregate Housing
Sex	Hispanic Origin	Vacancy Characteristics	Value of Owned
Race			Unit or Rent Paid

Sample Component

<u>Population</u>		<u>Housing</u>
Social characteristics:	Economic characteristics:	Source of water and method of sewage disposal
Education--enrollment and attainment	Employment and unemployment	Autos, light trucks, and vans
Place of birth, citizenship, and year of entry	Occupation, industry, and class of worker	Kitchen facilities
Ancestry	Place of work and commuting to work	Year structure built
Language spoken at home	Work experience and income in 1989	Year moved into residence
Migration		Number of bedrooms
Disability		Farm residence
Fertility		Shelter costs, including utilities
Veteran status		Condominium status
		Plumbing
		Telephone
		Utilities and fuels

Note: Subjects covered in the 100-percent component will apply to all persons and housing units. Those covered by the sample component will apply to a portion of the population and housing units.

CRIS is a cooperative service provided by the Institute for Policy Research, University of Wyoming, and the Research and Statistics Division, Wyoming Department of Administration and Fiscal Control.

We look forward to assisting you in the future.

G. Fred Doll
Institute for Policy Research
University of Wyoming

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Research and Statistics Division
Department of Administration and
Fiscal Control

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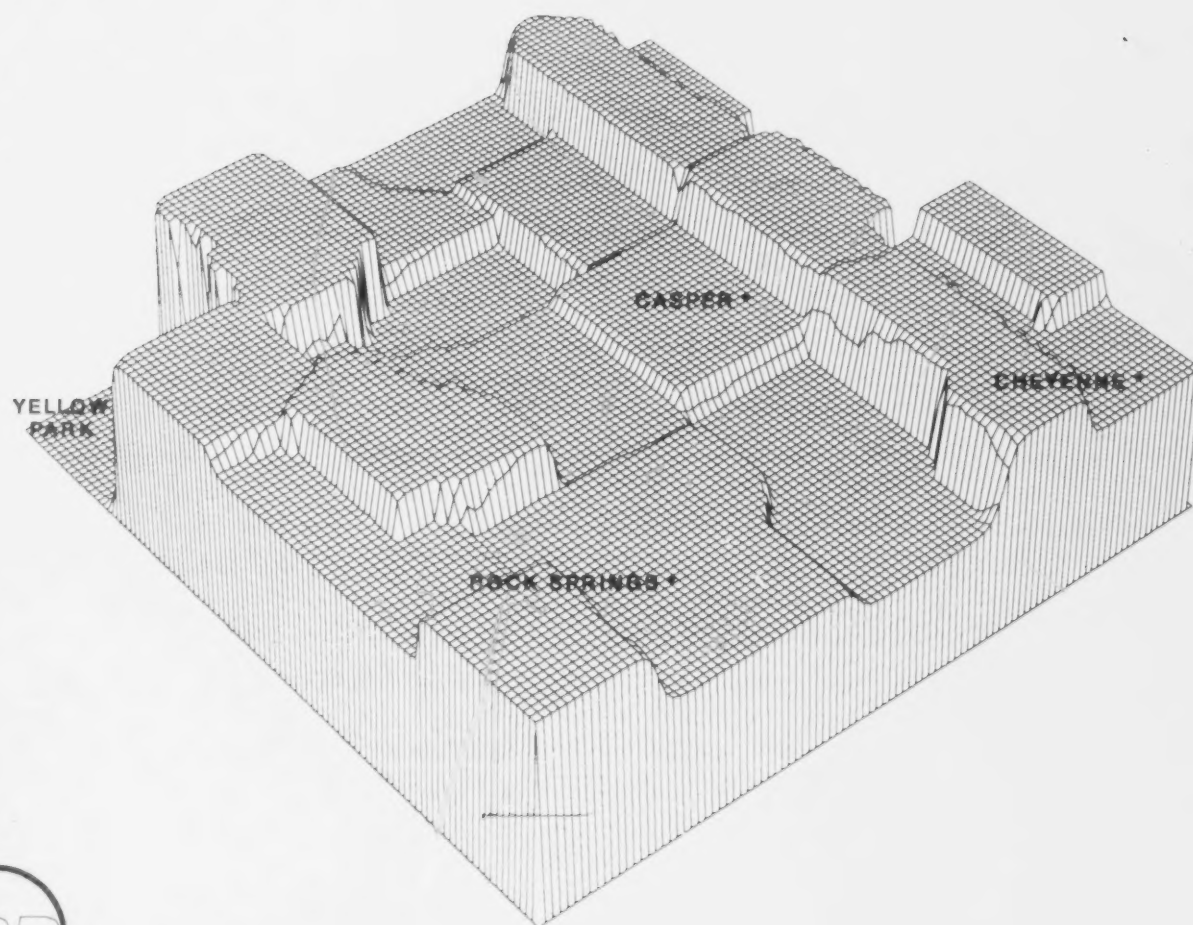
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WYOMING QUARTERLY UPDATE

WINTER 1989

Vol. 8, No.2



Optimism for Personal Financial Improvement in Wyoming

i

INSTITUTE FOR POLICY RESEARCH
OFFICE OF RESEARCH AND GRADUATE STUDIES
UNIVERSITY OF WYOMING

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Institute for Policy Research (IPR) at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of IPR greatly appreciates the ongoing, cheerful cooperation of each of the data sources listed in the bibliography.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by IPR. Readers are encouraged to contact IPR to find out how to gain access to data which do not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a contour map depicting optimism for personal financial improvement for Wyoming. The data for this graph are taken from the latest Wyoming Election Year Survey (WEYS) conducted by Professors Oliver Walter and Janet Clark of the Political Science Department at the University of Wyoming.

First-time readers of WQU should refer to the "format" explanations on page 48 for keys on how best to use and interpret data presented in this publication.

For additional information, contact:

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OTHER IPR SERVICES AND RESEARCH REPORTS ARE LISTED AT THE END OF THIS WQU.

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The articles appearing in this publication represent the opinions of the authors and do not necessarily reflect the views of the State of Wyoming or the University of Wyoming or their respective executive officers. Duplication or quotation of material in this publication is welcomed, but it is requested that WQU, the Institute for Policy Research, University of Wyoming, be credited.

**WYOMING
SCENE**

Winter Minerals Update

OVERVIEW

There were some pleasant surprises in regard to minerals during the last quarter of 1988. Perhaps the most significant was a strengthening of oil prices following OPEC's agreement on new production quotas. At the end of December, the price had not fallen to \$10 or less a barrel as some analysts had feared, and the more likely prognosis was that oil prices would show some moderate stability above \$14 a barrel for awhile. This optimism was born out as prices began to rise in January.

future, and it could even stabilize at or above the forecasted 155 million predicted for 1988.

Trona production has remained high due to increased demands related to a shortage of caustic soda.

A November announcement of significant Japanese contracts for Wyoming uranium increased optimism for the State's uranium industry. While it is still unclear how much uranium from Wyoming will really go to the announced contracts, there will certainly be some. Now at

Table 1: Wyoming Mineral Production Forecast to 1992¹

Calendar Year	Oil Production ²	Methane Production ³	Carbon Dioxide Production ³	Helium Production ⁴	Coal Production ⁵	Trona Production ⁵	Mined Uranium Production ⁶	In situ Uranium Production ⁷	Sulfur Production ⁸
*1981	122.1	455.4	--	--	102.8	11.8	4.6	--	0.05
*1982	118.7	465.1	--	--	107.9	10.1	2.1	--	0.07
*1983	120.9	539.7	--	--	112.2	10.5	3.0	--	0.57
*1984	127.8	600.1	--	--	130.7	11.0	1.6	--	0.63
*1985	131.0	597.9	--	--	140.4	10.8	0.6	--	0.80
*1986	122.4	563.2	23.8	0.15	136.3	13.3	0.3	--	0.66
*1987	115.9	622.7	110.5	0.84	146.5	13.6	0.2 ⁹	0.06	1.20
1988	117.0	689.5	110.5	0.84	155.0	15.1	0.02	3.0	1.20
1989	116.0	708.4	110.5	0.84	150.0	15.3	0.02	3.0	1.20
1990	110.0	728.0	110.5	0.84	151.0	15.5	0.02	3.0	1.20
1991	103.0	748.1	110.5	0.84	152.0	15.5	0.02	3.0	1.20
1992	96.5	768.9	110.5	0.84	153.0	16.5	0.02	4.0	1.20

* Actual values for comparison

¹ Geological Survey of Wyoming, January, 1989

² millions of barrels

³ billions of cubic feet

⁴ billions of cubic feet, based on Exxon's estimate that the average helium content in the gas processed at Shute Creek is 0.5 percent

⁵ millions of tons

⁶ millions of tons of uranium ore (not yellowcake)

⁷ millions of pounds of yellowcake (U₃O₈), (unknown between 1981-1986 because it was reported only as taxable valuation; estimates for 1988-1992 are based on company information)

⁸ millions of tons, converted from gallons of sulfur produced at gas processing plants as reported to the Wyoming Oil and Gas Conservation Commission

⁹ includes previously stockpiled ore processed by the Lucky Mc mill in 1987

We suspect that the record coal production that we forecast in the quarter will be exceeded. Instead of 153.3 million tons, production from Wyoming coal mines may well exceed 155 million tons in 1988. There is every reason to expect that annual coal production will remain above 150 million tons for the foreseeable

least four companies with properties in Wyoming apparently have new uranium contracts.

In the case of combustible natural gas, it still looks like California will become a significant market for some Wyoming gas production. Even one of the out-of-state competitors for this market indicated it too

would use some gas from Wyoming. However, a decision on which company or companies will supply this market has still not been made.

Overall, the prognosis for the State's mineral industry improved slightly in the last quarter of 1988.

*Gary B. Glass
State Geologist
Geological Survey of Wyoming*

OIL AND GAS UPDATE

Average posted prices for Wyoming Sweet declined every month from July through November, 1988, because of increased supplies of crude oil on the world market. The average posted price in July was \$14.75 per barrel; for August it was \$14.50; for September it was \$14.00; for October it was \$13.00; and for November it dropped to \$12.75. The good news was that posted prices for Wyoming Sweet crude oil climbed to an average of \$14.50 for December because of the production agreement signed by the OPEC oil ministers at the end of November. Future prices for 1989 delivery of West Texas Intermediate crude also climbed to between \$15.00 and \$17.00 per barrel. West Texas Intermediate generally trades for about the same price as Wyoming Sweet. The new agreement takes effect January 1, 1989, for a 6-month period and limits total OPEC production to 18.5 million barrels of crude oil per day. Prior to the agreement, oil analysts estimated total OPEC production at around 22.5 million barrels a day.

Unfortunately, the oil minister from the United Arab Emirates indicated that the output level set in the agreement was not his country's official quota. Past experience with OPEC's production agreements indicates that if one OPEC country cheats on its quotas, it is not long until other members follow suit and the increased production from cheaters within OPEC sends prices lower. Hopefully, the production agreement will hold and prices for Wyoming's crude oil will stabilize above \$15 a barrel.

The low prices from July through November are mirrored by the rig count for those months. The count shows a steady decline with the exception of a small increase in August. The average count for December, 1988, remained nearly level with the average count for November; however, the estimated average count of 36 for 1988 is almost the same as 1986 and slightly lower than the 1987 average count.

In an item related to the relatively low oil prices in 1987, figures recently released by the Interstate Oil Compact Commission and the National Stripper Well Association show that 18,241 stripper wells (wells that produce less than 10 barrels of oil a day) were abandoned in 1987. In the Rocky Mountain Region, Wyoming led in abandonments with 510. Colorado's 224 abandonments were a distant second. Wyoming had

3,486 stripper wells at the end of 1987. As recently as 1985, Wyoming had an estimated 5,200 stripper wells. The Wyoming Legislature's recent change in the definition of stripper production may have kept the abandonment level lower than it might have been. In 1986, for comparison, over 1,200 stripper wells were abandoned. This was before the Legislature redefined stripper production, thereby allowing operators of many marginal wells to report them as stripper wells. Stripper wells are taxed at a lower rate than other producing wells.

It was a banner year for lease sales in Wyoming. Total revenue from State and Federal sales was at a 4-year high. The U.S. Bureau of Land Management (BLM) instituted a new system of oral bids and auctioned off a very large amount of acreage. This new system helped raise total Federal revenues. On the negative side, the last two BLM and State sales realized less revenue than earlier sales in 1988. This was once again in response to low crude oil prices. The high per-acre bid at the October BLM sale was \$6,500 by General Atlantic Energy for a 160-acre lease in section 10, T.49N., R.70W. in the Powder River Basin. This lease offsets Minnelusa oil production in Winter Draw Field. This one tract accounted for a little over a quarter of the total revenue in this sale.

The high bid at the December BLM sale was \$330 per acre by Enron Oil and Gas for a 3.92-acre lease in the bed of the Green River in section 2, T.27N., R.112W. The lease offsets production in Bird Canyon Field. In all, 13 leases sold for \$100 or more per acre. Yates Petroleum was the most successful bidder at this sale and picked up 55 parcels.

The top bid of \$130 per acre at the Wyoming Department of Public Land's November sale was made for two Powder River Basin leases. Don Sullivan picked up an 80-acre lease in section 36, T.47N., R.71W., just south of Minnelusa production in Big Hand Field. Woods Petroleum bid successfully for an 80-acre parcel in section 36, T.48N., R.72W., just over a mile northeast of Minnelusa production in Oxbow Field. Only two other parcels received high bids of \$100 or more per acre. Very low oil prices in November and the fear that OPEC might not reach a production agreement helped make this sale a poor one in terms of total revenue and average price per acre.

Two environmental groups filed a protest against the BLM's December oil and gas lease auction in Wyoming on the grounds that the BLM failed to perform adequate environmental studies on the tracts. The BLM claimed that only 24 of the 766 parcels offered at this sale might be affected by the protest and the sale was held as scheduled.

U.S. Department of the Interior officials have refused to grant Exxon Corporation millions of dollars in extraordinary allowances. If these allowances had been granted, Exxon would have owed the Federal government substantially

lower royalty payments. Wyoming stood to lose several million dollars since half the Federal royalties come back to the State. The Minerals Management Service, which already granted Exxon allowances for reasonable costs associated with the Shute Creek gas processing plant in southwest Wyoming, denied the company relief under the extraordinary cost allowance provision of the Interior Department's product value regulations. Exxon must now pay \$6.5 million in additional 1988 royalties, but may appeal the decision.

In a somewhat related item, Wyoming's share of royalties, bonuses, rents, and other mineral revenue from mineral production on Federal lands totaled \$151.9 million during fiscal year 1987, which was a drop of \$1 million from fiscal year 1986. Wyoming received 40.3 percent of the \$377 million distributed to 29 states. According to the U.S. Department of the Interior (Minerals Management Service, 1988), oil companies in the State produced 71.3 million barrels of oil from Federal land, and gas companies produced 267.6 billion cubic feet of gas from Federal land. Of the \$151.9 million paid to the State, nearly \$98 million was from royalties on oil and gas production.

A draft environmental impact statement just released by the BLM concludes that Amoco Production's proposed carbon dioxide oil recovery project will have very few long-term adverse effects on the environment. If the proposed project is implemented, Amoco would drill ten wells in Raptor Field, build a gas processing plant in southwest Wyoming, lay 266 miles of trunk pipelines, and build plants to recover carbon dioxide at the fields proposed for tertiary recovery. Carbon dioxide flooding at Elk Basin, Salt Creek, Beaver Creek, and Little Buffalo Basin Fields could recover a total of 160 million additional barrels of oil according to the draft statement. Nearly 3,000 workers would be needed on the construction phases of the various projects planned between 1990 and 1994.

Another major new project is the proposed pipeline to supply gas to cogeneration projects in California. It was announced that the Wyoming-California Pipeline Company (WyCal) won conditional Federal approval for its proposed pipeline to California. A spokesman for the company said that the approval is helping the company in its negotiations with prospective shippers. The Kern River Gas Transmission Company would also ship Wyoming natural gas and is vying with WyCal for Wyoming's proposed \$250 million gas pipeline loan. It is expected that Kern River's application will also be approved soon. Probably only one pipeline will be built to supply southern California's market. Other pipelines, which originate outside Wyoming, are also in the competition. In fact, representatives of the Mohave Project made a presentation to Wyoming's Pipeline Authority in mid-December.

In a related matter, a conference sponsored by several State agencies and a legislative subcommittee was chaired by Governor Mike

Sullivan in Casper on November 30. The purpose of the conference was to help promote the sale of Wyoming gas to California markets. Attendees included officials from Wyoming as well as representatives from the California Public Utilities Commission, the California Energy Commission, a number of southern California utilities, the Federal Energy Regulatory Commission, and WyCal and Kern River Pipeline Companies.

The Interior Department will once again sell Federal land to holders of oil shale mining claims. About 54,000 acres in Lincoln County, Wyoming, are covered by 340 oil shale claims, but as yet no patent applications have been filed on the Wyoming claims. The patenting process allows claimholders to purchase land for \$2.50 per acre if they can prove that they invested at least \$100 a year to develop the oil shale on the claim.

Based on company data and on information compiled and published by Petroleum Information, the following significant exploration and development events occurred in Wyoming during the fourth quarter of 1988.

A. Amoco Production Company successfully fought off several appeals that would have prevented them from drilling the 1-35 Sohare Unit well in section 35, T.43N., R.112W. in Teton County, and they will begin construction of an access road next summer. The well will be drilled next summer and is projected to 11,050 feet in the Madison Limestone.

B. Texaco, Incorporated completed an exploratory well in the Luckey Ditch area. The 2 Whiskey Springs Unit in section 6, T.12N., R.114W. was completed in the Dakota and flowed 546 barrels of oil, 1.1 million cubic feet of gas, and 20 barrels of water per day. The well is a mile west of current production from the Dakota at Luckey Ditch Field.

C. Two new producing wells were completed in the Swan/Lincoln Road/Blue Forest area. General Atlantic Energy completed their 20-23 Federal well in section 23, T.24N., R.111W. for 975,000 cubic feet of gas and 75 barrels of condensate per day from the Dakota. Thermal Exploration completed their 2-8 Raptor Unit well in section 8, T.24N., R.111W. for 1,839,000 cubic feet of gas and 120 barrels of condensate per day, also from the Dakota.

D. Amoco Production announced plans to drill an 18,900-foot test to the Morrison Formation near Wamsutter, Wyoming. The well will be drilled in section 13, T.19N., R.95W., about three miles northwest of Wild Rose Field, which has produced gas from the Mesaverde Group.

E. Production casing was set at the 1 Outlaw-Federal well, drilled by Sun Exploration and Production in section 25, T.27N., R.92W. A completion will be attempted in the Frontier Formation at 14,347 feet. The nearest Frontier production is at Lost Soldier Field, nearly ten miles southeast of this well.

F. BHP Petroleum tested their 5-22 Sun Ranch Field development well in section 22, T.33N., R.86W. for 498 barrels of oil and

519,000 cubic feet of gas per day from the Muddy Sandstone. Effective November 23, the Wyoming Oil and Gas Conservation Commission ordered production from the Muddy Sandstone in Sun Ranch Field shut in until a pressure maintenance unit is formed. Evidence presented at the November hearing indicated that the Muddy is presently producing below the bubble point and the gas/oil ratio is increasing. Production should resume in the summer of 1989.

G. Tenneco Oil completed the 1-7 Schloegel-Federal well as a confirmation well for the Austin Creek Field discovery. The well in section 7, T.32N., R.84W. flowed 801 barrels of oil and 985,000 cubic feet of gas per day from the Muddy Sandstone between 10,723 and 10,763 feet.

H. A new Dakota pay zone was established by Marathon Oil Company in Big Medicine Bow Field. The 4-25 Big Medicine Bow Unit well in section 25, T.21N., R.79W. pumped 263 barrels of oil, 8,500 cubic feet of gas, and 13 barrels of water per day. The field presently produces from the Tensleep Sandstone and the Sundance Formation.

I. Lario Oil and Gas completed a Muddy Sandstone oil discovery in section 15, T.57N., R.72W. pumping 182 barrels of oil and 100,000 cubic feet of gas per day. The 1 Ute-Federal is a mile east of Muddy production at Ute Field.

J. Wolf Draw Field has its second producing well. Decalta International completed the 34-18 Wolf Draw Federal in July, 1988. The well, in section 18, T.52N., R.68W., produced 4,785 barrels of oil through September from the Minnelusa Formation.

K. Quintana has a probable Minnelusa oil discovery in section 35, T.51N., R.68W. Five barrels of oil per hour were swabbed from the 1-35 West Prong-Federal during tests. The well is a mile west of Prong Creek Field, which also produces from the Minnelusa.

L. Powder River Petroleum has an apparent Minnelusa discovery. The 41-1 Johnson well in section 1, T.36N., R.64W. was cased after a drill-stem test recovered 310 feet of gas-cut oil and 300 feet of highly oil-cut and slightly water-cut mud.

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*Rodney H. De Bruin
Oil and Gas Division Head
Geological Survey of Wyoming*

COAL UPDATE

Our previous estimate that Wyoming mines would produce 153.3 million tons of coal in 1988

may have been too low judging from the first three quarters of coal deliveries. Total coal delivered to electric utility companies from Wyoming mines through September, 1988, is over 10 million tons more than that reported for the same period a year ago. The hot, dry weather over most of the United States in July and August resulted in record coal deliveries from Wyoming mines these two months as coal-fired electrical demand continued. Even if coal deliveries during the remainder of the year only equal coal deliveries during the last three months of 1987, coal production in 1988 could exceed 155 million tons. This would break the State's coal production record set last year by 8.5 million tons. Although accurate production figures are not yet available, Kentucky's coal production in 1988 is expected to be equal to or greater than the 161 million tons that they produced in 1987, and Wyoming, therefore, will remain the Nation's second largest coal-producing state.

After record production in 1988, Wyoming coal production will probably drop slightly in 1989 as coal demand stabilizes in response to more normal coal usage. Coal production should reach or exceed 150 million tons a year each of the next 4 years. Slight increases in total production are expected in 1991 and 1992 as new coal supply contracts are signed and expiring contracts are renewed.

A comparison of Federal, State, and privately-owned coal production in Wyoming demonstrates the increased role of Federally owned coal in Wyoming. In 1981, only about 58 percent of the State's production was from Federal coal leases. By 1986, production from Federal coal leases (located primarily in the Powder River Basin) accounted for 82 percent of the State's total production. In contrast, coal production from State leases decreased dramatically between 1981 and 1987.

In 1987, the State of Wyoming received \$6.3 million in royalties from State coal leases, a decrease of almost 28 percent from the \$8.6 million in royalties received in 1986. Because coal production from State leases decreased only 20 percent between 1986 and 1987, part of the 28 percent decrease in collected royalties was caused by a decrease in the value of the coal. Indeed, the average royalty received from a ton of coal mined on a State lease in 1987 was 10 percent less than that received in 1986. The royalty rate on State coal ranges from 7 to 12.5 percent of the value of the coal; the average royalty rate may vary from year to year depending on which State leases produce coal that year.

Federal coal produced in Wyoming in 1987 was valued at about \$1.6 billion and generated about \$60.9 million in royalties (of which the State of Wyoming received half). In 1986, Federal coal produced in Wyoming was valued at \$1.5 billion and generated about \$28.5 million in royalty revenues. Although average coal

prices decreased between 1986 and 1987, many Federal coal leaseholders began paying a higher royalty rate in 1987. The royalty rate increase was mandated by the Federal Coal Leasing Amendments Act of 1976, which changed royalty rates from a cents-per-ton basis to 12.5 percent of the market value. Many of the large Federal coal leaseholders continued to pay royalties on a cents-per-ton basis in 1986 while protesting the readjustment of these leases to the 12.5 percent rate. When the U.S. Supreme Court declined to review a lower court's ruling on a case that upheld the 12.5 percent rate, the leaseholders were forced to pay the additional (deferred) royalties. The precedent-setting court ruling involved coal mined by FMC Corporation Wyoming, operator of the Skull Point mine in Lincoln County, Wyoming. Besides the additional royalty payments, Congress passed legislation in October, 1988, that allowed interest accrued from the deferred royalty payments to be shared on a 50 percent basis with the state where the coal was produced. As an example, coal produced in Wyoming by Amax Coal Company has been assessed additional Federal royalties of \$42 million, plus \$8 million in interest.

The Wyoming Department of Revenue and Taxation, Ad Valorem Tax Division, recently released its tabulation of taxable valuation for 1988. Coal valuation was \$1.006 billion in 1988, a decrease of \$105 million from the previous year. Taxable coal production increased from 128.1 million tons in 1986 to 132.7 million tons in 1987. In the case of minerals, assessed production is that of the previous year. In 1988, coal accounted for 16.8 percent of the total assessed valuation of Wyoming and about 28 percent of the assessed valuation of minerals in Wyoming. It is interesting to compare 1988 assessed valuations for the State of Wyoming with valuations in 1986 (mineral valuations are based on 1985 production). The 1986 valuations were before oil and gas prices (as well as coal prices) dropped. Although non-mineral valuation remained nearly constant between 1986 and 1988, its proportionate share of the State's total valuation has increased from nearly 30 percent in 1986 to 40 percent in 1988. This difference is directly related to the decline in the value of energy minerals produced in the State.

The average assessed value per ton of Wyoming coal produced in 1987 was \$7.58, a decrease of 12.6 percent from the previous year's \$8.67 a ton. Coal from the Powder River Basin dropped in value from \$6.63 a ton to \$6.04 a ton, a decrease of 8.9 percent; coal from southern Wyoming decreased in value from \$20.74 a ton in 1986 to \$18.07 a ton in 1987, a decrease of 12.9 percent.

This fall, the Wyoming Supreme Court ruled on a legal action brought by the Wyoming Mining Association and a group of Wyoming coal producers against the State Board of Equalization's decision to extend the 2 percent

coal impact tax into 1987. This tax was due to expire on January 1 of the year after total proceeds from the tax reached \$160 million. Many coal companies prepaid some of their severance taxes for 1987 in 1986 in an attempt to push the impact tax account over the \$160 million by the end of 1986. In the judicial review of the case by the Wyoming Supreme Court, it was ruled that the coal impact tax did indeed expire in 1986 (after exceeding \$160 million in cumulative taxes) and that the State of Wyoming was able to accept advance tax payments from the coal producers.

In another legal action, this time involving a coal transportation issue, an out-of-court settlement was reached in late November between Burlington Northern, Inc. (BN) and Energy Transportation Systems, Inc. (ETSI). ETSI had brought a damage suit against several railroad companies in connection with ETSI's failed coal slurry pipeline project. The settlement calls for BN to pay ETSI \$175 million; in turn, all legal action against BN by ETSI and an intervenor in the suit, Houston Lighting and Power Company (HL&P), was terminated. In earlier settlements and court decisions, Union Pacific Railroad (UP), Kansas City Southern Railway Company (KCS), and Chicago and North Western Transportation Company (C&NW) have all paid damages to ETSI. Part of the BN's settlement with ETSI/HL&P involves \$58 million in cash payments to HL&P and future rate adjustments on the remaining 12 years of a transportation contract from the Powder River Basin to HL&P power plants. Additional lawsuits against KCS and Atchison, Topeka, and Santa Fe Railway Company are still pending.

Development in the Hanna Basin

The most important development during the last quarter of 1988 was the mid-December announcement that Arch Mineral Corporation had purchased Union Pacific Mineral's (UPM) share of Medicine Bow Coal Company's mine west of Hanna and planned to shut down their Seminole 2 mine. Arch of Wyoming (a wholly-owned subsidiary of Arch Mineral Corporation) and UPM had operated Medicine Bow as a joint venture; the coal company and the mine will now operate as a joint venture between Arch Mineral Corporation and Arch of Wyoming. The 74 miners at Seminole 2 would presumably have an opportunity for employment at Medicine Bow, which currently employs only 24 miners.

The Seminole 2 mine has been a mainstay of Hanna Basin coal production since the mine opened in 1972. A total of 31.3 million tons of coal had been mined at Seminole 2 through 1987; Arch estimated that 1.75 million tons of coal would be produced by Seminole 2 in 1988. The mine's peak production year was 1975, when 2.9 million tons of coal were produced. Peak employment at Seminole 2 was 325 miners in 1979. Kansas Power and Light Company's contract for coal from this mine apparently will be met in

February, 1989, after which Arch plans to begin reclamation at the mine.

The Medicine Bow coal mine has no major coal contracts at present, but in 1988 it provided test shipments of coal to five different customers. Evidently, any new contracts or coal sales from Arch's Hanna operations will be filled by coal from Medicine Bow. Even though the heating value of coal from the Medicine Bow mine is less than that at Seminoe 2, the mining costs (including mining ratios, overburden handling, and coal haulage costs) at Medicine Bow are lower than at Seminoe 2, thereby making the coal's price more competitive.

In November, Western Fuels Association (WFA), a fuel buyer for numerous utility companies, announced that one of their member utilities, Kansas City Board of Public Utilities (KCBPU) was conducting test burns of coals from both the Medicine Bow mine and Cyprus-Shoshone Coal Company's Shoshone No. 1 underground mine. This is the first use of Hanna Basin coal by a member of WFA (a traditional Powder River Basin coal buyer). Evidently the higher heating values of coals in the Hanna Basin are a selling point because WFA announced that they were also considering a high-Btu coal or a beneficiated (dried) coal from the Powder River Basin as a fuel source for KCBPU. This was the second indication in 1988 that coal from the Hanna Basin will probably have to compete with the dried coal product that will soon be available from Powder River Basin coal producers.

Development in western and southwestern Wyoming

The Federal Energy Regulatory Commission (FERC) recently gave conditional approval to the proposed merger of PacifiCorp (parent company of Pacific Power and Light Company) and Utah Power and Light Company. If the merger were to take place, PacifiCorp would become the Nation's 13th largest utility company, serving 1.2 million customers in a seven-state area. A condition placed on the proposed merger requires that PacifiCorp provide space on its transmission lines for use by other utilities. FERC explained that the condition placed on the merger was necessary to ensure competition and to prevent the merged company from developing a monopoly. PacifiCorp and Utah Power and Light Company have until January 25, 1989, to decide whether or not to proceed with the merger. Editor's note: the companies did merge in early January, 1989.

Developments in the Powder River Basin

Two projects involving coal in the Powder River Basin, Wyoming, were announced in the last quarter of 1988. First, Carbontec Corporation of Bismarck, North Dakota, was awarded a \$1.0 million loan from the Wyoming Investment Fund

Committee for testing Wyoming coal in a coal-drying demonstration plant. The Carbontec process uses oil-based chemicals to draw moisture out of the coal. According to Carbontec, their dried product does not disintegrate or undergo spontaneous combustion like conventional, thermally dried coal products. A typical coal with 30 percent moisture and a heating value of 8,500 Btu/pound will reportedly yield a product with a heating value of 11,000 to 12,000 Btu/pound and 10 percent moisture. If the demonstration plant in North Dakota is successful, Carbontec will ask for an additional \$0.8 million to start construction of an \$8.9 million commercial plant near Gillette.

The second project is a modified coal liquefaction process developed by SGI International of La Jolla, California. The company announced that Shell Mining Company would be a financing partner in construction of a liquefied-from-coal (LFC) plant near Triton Coal Company's (a subsidiary of Shell Mining Company) Buckskin mine north of Gillette. If constructed, the plant would convert up to 1,000 tons per day of coal from the Buckskin mine into a solid-fuel product, plus a hydrocarbon-liquid by-product. The process is reportedly a low-temperature, atmospheric pressure, pyrolysis technique that leaves the pitch and tar in the solid product, which is a dry, clean-burning solid fuel with heating values of 11,000 to 12,500 Btu/pound. Approximately one-half to one barrel of liquid hydrocarbons is recovered from each-ton of processed coal as a by-product.

Amax Coal Company appears to be very close to completion of the first commercial coal-drying facility in the Powder River Basin. A recent article in Mining Engineering, (vol. 40, no. 11, November, 1988, p. 1031-1032) reviewed the Amax facility and reported that the first coal-drying unit would be operational in January, 1989. Amax also announced in the last quarter of 1988 that total cumulative coal production at their Eagle Butte surface mine north of Gillette had exceeded the 100 million ton milestone. The Eagle Butte mine began production in 1978. Three other mines in the eastern Powder River Basin preceded Eagle Butte in attaining the 100-million-ton production level: Amax's Belle Ayr mine, Thunder Basin Coal Company's Black Thunder mine, and Kerr-McGee Coal Corporation's Jacobs Ranch mine.

Coal Contracts

In the last quarter, the announcements of new coal contracts appeared to slow down as most utility companies had secured their fuel supplies for the rest of the year and were only signing short term or spot contracts for early 1989. A summary of contract activity follows:

- 1) Rochelle Coal Company, a subsidiary of Peabody Holding Company, will furnish 15,000 tons of spot coal to Fremont, Nebraska

Department of Utilities, from the Rochelle mine. The coal will be delivered before the end of 1986 and will be used for test burns in two generating units. The FOB mine price of the coal is reportedly \$4.60 a ton while the delivered price (via rail) is \$15.60 a ton.

2) Rochelle Coal Company will also supply 50,000 to 100,000 tons of coal to Minnesota Power Company during 1989. Delivered price of the spot coal (including final delivery by barge) is \$23.50 a ton. Minnesota Power also expects to purchase as much as 400,000 tons of additional spot coal in 1989.

3) Rochelle Coal Company will also supply Empire District Electric Company in Kansas with 200,000 tons of spot coal. This is in addition to the 300,000 tons of coal that Rochelle began supplying to Empire in July, 1988. Deliveries continue into 1989.

4) Thunder Basin Coal Company's Black Thunder mine is supplied 72,000 tons of coal to Nebraska Public Power District's (NPPD) Sheldon generating plant through December, 1988. The coal was delivered through an interim agreement while NPPD negotiates a new agreement with Thunder Basin for additional coal above a contract minimum (this relates to a current contract to NPPD's Gentleman power plant) as well as new tonnage for the Sheldon power plant. The 2-month spot sale from Black Thunder called for a delivered price of 77.3 cents per million Btu. In contrast, a previous contract to the Sheldon plant with Fort Union Coal Company carried a delivered price of 92 cents per million Btu.

5) Amax Coal Company will supply 500,000 tons of coal from their Belle Ayr and Eagle Butte mines to Omaha Public Power District's North Omaha power plant in Nebraska. The coal will be delivered via Burlington Northern Railroad (BN) between November, 1988, and April, 1989.

6) Carter Mining Company will supply 400,000 tons of coal from the Rawhide mine to Sunflower Electric Cooperative's Holcomb generating plant in Kansas via the BN and the Atchison, Topeka, and Santa Fe Railroads. The contract, which was negotiated by Western Fuels Association (WFA), calls for delivery of the coal during the first half of 1989. The FOB mine price is reportedly less than \$4.00 a ton.

7) Carter Mining Company will also supply Kansas City Board of Public Utilities' Nearman Creek generating plant in Kansas with 150,000 to 180,000 tons of coal. The coal will come from either the Rawhide or Caballo mine. Deliveries began in October, 1988, via the BN and the Union Pacific Railroads. The contract was negotiated by WFA. The FOB mine price of the coal is reportedly between \$3.80 and \$3.90 per ton.

8) During the second half of 1989, Cordero Mining Company (a subsidiary of Elk River Resources) will supply 2 million tons of spot coal from the Cordero mine to Basin Electric Power Cooperative's Laramie River generating

station in Wyoming. Delivery will be by BN and the FOB mine price of the coal is reportedly less than \$4.00 a ton. The contract was negotiated by WFA for Basin Electric.

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INDUSTRIAL MINERALS UPDATE

Aggregate

Production of construction aggregate in Wyoming declines during the winter months as highway paving, building construction, and other projects that use aggregate close or slow down. Despite this seasonal downturn, there were a few aggregate-related developments in the last quarter of 1988.

Small quantities of a red granite from near Lusk were shipped to Utah for use as decorative aggregate. In addition, crushed marble from Wheatland was almost used in the Colorado Convention Center in Denver. This latter material, consisting of very finely ground marble, would have been used for smooth, white, precast concrete in facings and pillars. A contract with Georgia Marble, the company that owns Basins, Inc. in Wheatland, was cancelled when Colorado decided it did not want to use an out-of-state product on the center. A Colorado company must now reopen an abandoned quarry in west-central Colorado to provide a similar material.

Officials in Grand Teton National Park are looking for sources of construction aggregate for park roads and structures. Although Jackson Hole and the surrounding highlands are rich in aggregate raw materials, zoning, park regulations, and other restrictions have made the development of a local aggregate pit almost impossible in that area. Therefore, aggregate for park construction will probably have to be brought in from elsewhere, possibly from out-of-state.

Bentonite

Bentonite production remained low through 1988 due to the low demand for oil well drilling muds. No significant improvement is expected in 1989. However, Wyoming remains the Nation's leading supplier of bentonite. Specialty bentonite, which is used in soaps, cosmetics, and fillers, and bentonite for foundry castings, continue in demand. One new (to Wyoming) company is still planning to open operations near Casper.

Cement

Mountain Cement's modernized and expanded plant in Laramie was operating at near full

capacity at the end of the year. Cement is produced from limestone, gypsum, and marl quarried near the plant. Mountain Cement Company is using tailings from the Iron Mountain mine, which produced magnetite ore in the 1940s, as a source of iron additives. These tailings are located about 42 miles northeast of Laramie, and about six miles east of the Plumbago Creek Road (Albany County Road 12).

Nationally, production of cement in 1988 is slightly higher than in 1987 according to preliminary figures from the U.S. Bureau of Mines. This increase is an indication of a more healthy national economy reflected in increased construction. Because most of Mountain Cement's production is consumed in Colorado, Nebraska, and Wyoming, expanded production from the Laramie plant reflects economic growth in this region, particularly the Colorado Front Range area.

Gypsum

Gypsum is quarried in Wyoming at three locations. Two plants in the Bighorn Basin continue to produce wallboard, made from refined and pressed gypsum. In the Laramie Basin, Mountain Cement's Laramie cement plant is using more gypsum as full production is approached. Overall, 1988 gypsum production in Wyoming probably increased slightly over 1987. Next year's production should also increase slightly over 1988.

Limestone

Limestone is quarried, crushed, and screened in Wyoming for use in highway construction projects, cement, and power rock (used for burn and emissions control in coal-fired power plants). A quarry was opened about six miles north of Hartville this year to supply power rock to the Laramie River power plant near Wheatland. Limestone from north of Rawlins is used in power plants near Craig, Colorado.

Phosphate and fertilizer production

Phosphate from Utah is combined with Wyoming sulfur to produce fertilizer at the Chevron Chemical Company's plant near Rock Springs. Production of fertilizer at this plant is up slightly over last year. The sulfur used at this plant is produced as a by-product from the refining of sour gas (natural gas containing hydrogen sulfide) from Chevron's gas fields in western Wyoming.

Nationally, phosphate production has increased over 1987 levels by about 10 percent according to the U.S. Bureau of Mines. The Bureau also estimates that western phosphate production (Idaho and Utah) has increased by about 15 percent. Chevron's Wyoming plant has apparently increased fertilizer production and

phosphate production from their Utah mine by about 20 percent.

Tripoli

Tripoli, a fine-grained silica material, has been discovered (or rediscovered) in Wyoming. A 1928 news article described an occurrence of tripoli "six miles north of Hartville". Recently, the Head of the State Survey's Industrial Minerals Division asked Hartville residents if they knew of any light-weight, white, hard material in the area. A local rancher reported that he knew of some material that his father had used to sharpen plows. When this material was located, it turned out to be amorphous, pure, fine-grained silica, or tripoli. The area is now under study by the Geological Survey of Wyoming and a request for a block grant from the Economic Development and Stabilization Board was prepared by Platte County and the Town of Guernsey. Hopefully a grant will be awarded so that there are funds to determine the quality and extent of the resource.

Tripoli is used as an abrasive and mineral filler. It is mined in Pennsylvania, Illinois, and Missouri. Scouring powders, toothpaste, and other industrial abrasives may contain tripoli.

Trona

For the first time since the completion of the Tenneco soda ash refinery near Green River in 1982, all five soda ash (refined trona) producers are operating at or near full capacity. This year's increase in soda ash production is due almost solely to the substitution of soda ash for caustic soda in some industrial processes. Industry representatives disagree about whether this market will continue to fuel high demand for soda ash. While the major use of soda ash is in the production of glass, the glass market shrank in the 1982 recession and has never completely recovered although domestic glass production has greatly increased since then.

The export market for soda ash remains about constant at the present time. Foreign production of soda ash is primarily by a more expensive chemical process. Trade barriers continue to prevent less expensive, mined trona from the U.S. and elsewhere to be used for much of this market.

In addition to the production of soda ash, a new plant that produces finished products from soda ash opened this fall near Green River. Church and Dwight dedicated the new plant that produces washing soda, laundry detergent, and similar products. These products will be marketed under the Arm & Hammer brand. This plant will employ about 40 people.

FMC is proceeding with its plans to construct a 60-million-pound-per-year sodium

cyanide plant near their soda ash plant west of Green River.

URANIUM UPDATE

There are several encouraging signs to report this quarter relative to Wyoming's uranium mining industry. Although these indications of increased production are welcome, they are not indicative of a return to the boom years of the 1970s.

Wyoming's Congressional Delegation announced the purchase of 15.8 million pounds of U.S. uranium by five Japanese power companies over the next 10 to 12 years. About 7.5 million pounds of this uranium (U_3O_8) will be supplied by three companies which operate in Wyoming: Pathfinder Mines, Malapai Resources, and Everest Mines. However, the contracts announced between these producers and the Japanese were not specifically for Wyoming mines. All three producers have uranium properties elsewhere, so the total supplied from Wyoming may not be 7.5 million pounds. Another factor that may affect how much Wyoming uranium is mined is the possible availability of previously produced uranium, which might be less expensive to acquire than mining and processing new ore.

In a separate announcement, Malapai Resources, which operates an in situ mine near Pumpkin Buttes, reported agreements were signed with Tokyo Electric Power Company and Chubu Electric Power Company for 1 million pounds of uranium each. Initial deliveries are to begin in 1990. This announcement apparently relates to the agreements reported by Wyoming's Congressional Delegation. According to a company spokesman, this 2 million pounds may come from its Wyoming property. This represents a significant increase in production for Malapai and is a positive step towards increased uranium production in Wyoming.

Everest Minerals Corporation apparently has at least an agreement with Tokyo Electric for 1 million pounds of uranium. The agreement calls for deliveries over a 10 year span beginning in 1990.

Pathfinder Mines, on the other hand, has said that possibly none of the 3.5 million pounds it will supply to Japan will come from Wyoming. John Atkins, Pathfinder's governmental affairs representative, said the "regulatory and tax situation in Wyoming" may cause the company to develop Arizona uranium properties rather than increase production from either its active Shirley Basin or inactive Gas Hills properties. Pathfinder does plan to ask the Wyoming Legislature for a 3.5 percent reduction in uranium severance taxes (from 5.5 percent to 2 percent).

In an earlier effort to reduce their taxes, Pathfinder filed a challenge to the Wyoming State Board of Equalization's 1986 decision to

base severance tax rates for uranium on the market price, rather than a rate of \$8 per pound. The \$8 per pound rate reflected a 1950s market price. This challenge was denied by the Wyoming Supreme Court in mid-December, 1988, when the court ruled that the State Board of Equalization acted properly in adjusting the rates.

Regarding the State's mineral tax structure, the Wyoming Department of Revenue has issued a new proposal on uranium valuation. The proposal maintains the existing tax structure, but allows for tax deductions for some processing costs, transportation, return on investment, and royalty payments.

A Riverton uranium company also announced some new uranium contracts. These contracts were apparently not included in the 15.8-million-pound purchase mentioned above. USE-CC, a Joint Venture of U.S. Energy Corporation of Riverton and Crested Corporation, 44 percent of which is owned by U.S. Energy, stated that it will supply 1.8 million pounds of uranium oxide (yellowcake) to two unnamed utilities beginning in the early 1990s. This uranium may be produced from the Crooks Gap district south of Jeffrey City.

Meanwhile, Wyoming received \$4.4 million from the Federal government to reclaim an abandoned open pit uranium mine in the Gas Hills. The grant will provide funds for the reclamation including the removal of acid and radioactive waste on the 274-acre site. This unreclaimed mine operated prior to 1969.

The removal of uranium mill tailings from the abandoned Susquehanna-Western mill site south of Riverton began in 1988, but recently closed for the winter season. About 50 percent of the cleanup has been completed. So far, 1,028,000 cubic yards of material have been shipped and buried in an open pit mine site in the Gas Hills. This has involved 46,700 round trips of 110 miles each for the trucks doing the hauling. The hauling is expected to be completed next year.

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METALS AND PRECIOUS STONES UPDATE

High gold, platinum, and palladium prices continued to stimulate exploration activity in Wyoming during 1988. In the Medicine Bow Mountains of southeastern Wyoming, four companies continued searching the Lake Owens and Mullen Creek layered complexes for all three of these metals. By mid-year, one of the four companies terminated exploration activities in the Medicine Bows because of lack of success.

Later, however, another exploration group began searching for precious metals in the Lake Owens area.

The southern Sierra Madre was the site of a claim-staking rush that was initiated by rumors of the discovery of a large massive zinc, copper, and silver deposit a short distance south of Wyoming's border near Pearl, Colorado. Broken Hill and Cap Rock were reported to be drilling in Colorado. The staking in Wyoming was along the projected trend of the massive sulfide deposit.

A fair amount of activity continued in the Bear Lodge Mountains throughout 1988. At least four companies were searching for disseminated gold and rare-earth mineralization in the Tertiary alkalic complex of those mountains. The activity included both geochemical sampling and drilling.

The South Pass greenstone belt continued receiving some activity. Three Australian and one Canadian company with mineral interests in the district were financially crippled by the 1987 stock market decline, and did no known work in 1988. And the Gyorvary Mining Company completed the construction of its mill at the Mary Ellen gold mine, but was unable to satisfy all of the necessary requirements to obtain an operating permit.

On the brighter side, two drilling projects were scheduled in the district, and a third company made a discovery, which they plan to continue testing next summer. The district also received the attention of two large domestic companies. One of these two companies intersected a 30-foot-wide shear zone with ore-grade mineralization at an undisclosed location.

Throughout the 1988 summer, two placer mines operated at South Pass -- one in Rock Creek and the second at Wilson Bar. Some placer exploration was reported elsewhere in the district, and some walnut-size nuggets were discovered at an undisclosed location. Some activity was also reported on the Twin Creek paleoplacer to the northeast.

Placer mining and exploration activity continued at many locations in the State during 1988. Besides South Pass, some placer exploration and mining occurred in northwestern Wyoming south of Jackson, and along Crandall Creek near the southern margin of the Beartooth Mountains. In northeastern Wyoming, placer mining was reported in the Mineral Hill district of the Black Hills; in southeastern Wyoming, some activity occurred in the Douglas Creek district of the Medicine Bow Mountains, in the Sierra Madre, and near Baggs.

During the 1988 field season, the Metals Division of the Geological Survey of Wyoming conducted cursory examinations of several mineralized terranes in Wyoming. Many of the samples collected during these reconnaissance surveys have now been assayed.

In the Black Hills of northeastern Wyoming, samples were collected from three districts

where mineralization is associated with altered Tertiary alkalic igneous intrusives. These are the Black Buttes, Mineral Hill, and Bear Lodge Mountains areas. At Black Buttes (also known as the Hurricane district), which is located six miles south of Sundance, several prospects lie along the contact of a Tertiary trachyte porphyry with Mississippian Pahasapa Limestone. In the NE/4 sec. 26, T.50N., R.62W., brecciated limestone is partially replaced by hemimorphite, galena, minor wulfenite, and rare fluorite (Hausel, 1988a). A group of samples collected from this and other prospects contained significant mineralization. For example, one jasperoid sample assayed 3.2 ounces per ton silver, 0.28 percent lead, and 8.3 percent zinc. A sample of mineralized limestone breccia contained 5.8 ounces per ton silver, 0.51 percent lead, and 7.4 percent zinc.

The Mineral Hill district lies east of Black Buttes on the Wyoming-South Dakota border. Historically, Mineral Hill produced significant quantities of placer gold and tin during the late 1800s, and recently the district has been considered for possible disseminated epithermal gold deposits. However, the few samples collected in the Mineral Hill district were only weakly mineralized. The Bear Lodge Mountains are located immediately north of Sundance, Wyoming. These mountains are formed of a Tertiary alkalic igneous complex intruded into Paleozoic sedimentary rocks. Large blocks of Precambrian granite are rafted in the Tertiary complex.

Samples collected in the Bear Lodge Mountains complex show a couple of weak gold and silver anomalies. However, the most interesting samples collected were trachytes partially replaced by manganese (Hausel, 1988b). These samples suggest there could be a potential for a large-tonnage, low-grade manganese resource in addition to the large-tonnage, low-grade rare earth and thorium resources reported by Staatz (1983) in the Bull Hill area. Manganese is considered a critical strategic metal (Hausel, 1987).

In the Mormon Canyon area along the northern flank of the Laramie Range south of Douglas, a fragmented Archean metasedimentary-metavolcanic terrane is intruded by granite. This region has some exposed quartz veins hosted by amphibolite.

A sample of copper-stained milky quartz from a 30- to 40-foot-wide strike vein in sec. 14, T.32N., R.76W. was taken. This sample contained low-grade copper and traces of gold and silver.

At Mine Hills (sec. 10, T.26N., R.75W.) in the extreme eastern part of Shirley Basin, manganese occurs as replacements and fracture fillings of Casper Formation sandstone. Mine Hills was once mined for manganese, resulting in the recovery of small tonnages of manganese ore during the early 1900s (Hausel, 1987). Four samples collected from this area showed

significant manganese, ranging from 1.18 percent to 29.8 percent manganese (Hausel, 1988d).

In the Warbonnet copper district of the northern Laramie Range, a group of mines were located on cupriferous veinlets in Proterozoic mafic dikes. These dikes intrude Archean granite (Hausel, 1988e). The Oriel shaft (SE/4 sec. 10, T.29N., R.75W.) was sunk on a N40°E mafic dike. Samples from the mine dump contained chalcopyrite and minor copper carbonates. Two samples collected for assay yielded 1.14 percent and 1.18 percent copper with no detectable gold or silver, respectively.

Finally, samples of massive pyrrhotite were collected from prospects along "gossan hill" in the McCann Pass area of the Hartville uplift (sec. 24, T.28N., R.65W.). The one sample that has been assayed to date yielded only 0.19 ounce per ton silver.

Of significant interest to hard rock mining and prospecting, the U.S. Bureau of Land Management is initiating an increase in fees for paperwork related to mining claims. According to an article in the Public Lands News (vol. 13, no. 24, Dec. 8, 1988, p. 6) the following fee increases are anticipated:

Mining claim application	- \$ 10 (was \$5)
Annual assessment	- \$ 5 (was no charge)
Transfer of interest	- \$ 5 (was no charge)
Amendment of claim	- \$ 5 (was no charge)
Deferral of assessment	- \$ 25 (was \$10)
Patent application	- \$250 (was \$25)
Each additional patent application	- \$ 50 (was no charge)

In 1989, no significant increase in exploration activity for metals is anticipated in Wyoming unless a major discovery is made. This is because most mining companies are dedicating most, if not all of their available resources to Nevada. Nevada reportedly has a very favorable political and geological environment for metals mining.

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Note: The Geological Survey of Wyoming has a public file of unpublished Mineral Reports ranging from the late 1800s to the present. These are available for inspection at the State Survey Building on Campus in Laramie.

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Agriculture Situation and Outlook

The 1989 price and production outlook for agricultural products is anticipated to be a "weather market" through mid-summer. The primary effect of 1988s drought was to sharply reduce the carryover of most agricultural food and feed grain supplies. In the United States, yields were sharply lower for most crops and some acreage was lost to the drought. Output dropped nearly 30 percent for grains and over 20 percent for soybeans. Although most agricultural product prices moved higher in 1988, a sharp increase was avoided because of near record carryover supplies and a stable export market. Looking ahead to 1989, a repeat of last year's widespread drought in the United States is not anticipated. There is some validity in this optimism, because the U.S. has not experienced severe back to back droughts in this century.

The outlook for livestock producers for the coming year generally remain optimistic. Assuming that 1988s drought does not repeat, production of all classes of feed grains are expected to increase, putting downward pressure on production costs in the latter half of the year, while livestock prices are expected to remain strong. Cattle prices are expected to be the bright spot in the meat industry in 1989.

GRAINS

Wheat

The world wheat situation changed dramatically in 1988, from overproduction to concerns about short-supplies. Record disappearance will be facilitated by increased foreign production and stock drawdowns. The 1989 wheat crop will begin with the lowest stocks-to-use ratio since the early 1970s.

The focus of this year's situation has been on drought-reduced crops in North America. The 1988 drought hit the Northern Plains the hardest, reducing the spring and durum crops to about half the 1987 production, the lowest since the early 1960s.

Hard red winter production declined to the lowest in a decade because of greater enrollment in the Conservation Reserve Program, unfavorable weather, and disease conditions prior to harvest.

Total disappearance of U.S. wheat in 1988/89 is forecast to be the fourth largest ever, despite a small carryin and low production. Domestic use will continue at around 1.1 billion bushels, about the same as for the previous five years.

Food use of wheat has shown a steady increase and likely will rise again. Feed and residual use, which has fluctuated between 280 and 400 million bushels in the past five years,

probably will fall near the lower end of the range.

Feed Grains

The drought of 1988 is by far the most significant factor in the current feed grain situation. The 1988 harvest of the four feed grains (corn, sorghum, barley, and oats) was 141.7 million metric tons, down 34 percent from a year earlier and the lowest since the drought- and Payments-In-Kind (PIK) reduced crop of 1983. Barley and oats suffered the greatest damage, sorghum the least. Because of the drought, the drop in the availability of feed grains is expected to lead to a 60 percent decline in 1988/89 carryout stocks.

Corn comprises about 82 percent of the total feed grain supply. With yields down 31 percent and harvest area down 4 percent, corn production was estimated to be 34 percent lower in 1988 compared with a year earlier.

The forecast for the 1989 corn crop is for sharply higher production. Total feed grain acreage is expected to increase, and could add 8 to 10 million acres in corn plantings, raising the area harvested for corn to the 67 to 69 million acre range. If we return to normal weather, estimates for 1989 corn yields range from 110 to 115 bushels per acre, with yields of 120 bu/A not out of the question. This would result in 1989 corn production in the 7.7 to 8.3 billion bushel range, compared to 1988s 4.9 billion. If 1989 production is at the high end of the range, farm prices would fall near the loan rate of \$1.65 per bushel, compared to \$1.94 in the 1987/88 crop year and \$2.40 to \$2.80 in 1988/89 crop year.

LIVESTOCK

Cattle

Beef consumption in 1989 is expected to decline 5 percent to 7 percent from 1988, reaching the lowest level since 1980. In contrast, expected larger supplies of poultry and continued big pork output will leave total meat supplies only slightly below the 1988 record.

The general economy in 1989 is expected to grow at a slightly slower pace than in 1988. Rising consumer incomes and high employment rates likely will provide continued support for meat prices. A favorable economic environment will have to be maintained if record retail beef prices expected in 1989 are to be met with little consumer resistance.

The U.S. cattle inventory dropped below 100 million head on January 1, 1988, for the first time since 1961. The 1987 and 1988 calf crops

were also the lowest since 1961. The 1989 January USDA inventory reported 99.484 million head, essentially the same as a year earlier.

The inventory does report a marginal increase in beef cow numbers and beef replacement heifers. This rise in beef cow and heifer replacement numbers from a year earlier does suggest that the industry has shifted from liquidation to expansion, but have not yet begun to offset declines recorded over the past several years. Turning to the 17 western and plains states, as a region, cow inventories remain 12 percent below 1984 levels, with top ranked Texas and Oklahoma both down 10 percent and third ranked Nebraska down 17 percent. Only New Mexico and Wyoming have maintained or rebuilt stocking rates to levels comparable to five years ago.

Future increases in breeding herds will be needed to offset current declines in the light calf inventory. The 17 state region reported calf numbers under 500 pounds down 6 percent from a year earlier, and down 30 percent from 1984. The average calving rate in the Western states rose several points in 1988, but continued to stay below the national average in all but a few states. The chances for 1989 calving rates to decline slightly from the previous year seems likely to those areas impacted by last summers drought.

The upshot of the declining cattle supplies and potentially reduced feed grain prices by next fall, is strong to marginally higher feeder cattle prices for Wyoming producers in the fall of 1989. Grass type cattle will be in high demand in April and May, pressing prices for 450 to 600 lb feeder animals 4 percent to 7 percent higher than last spring.

Sheep and Lambs

Prices for sheep and lambs tumbled in 1988 as commercial lamb production increased 5 percent from 1987 to over 325 million pounds. Slaughter lamb prices fell nearly \$20 per cwt to average near \$62 by year-end. Continued modest expansion in sheep inventories is likely in 1989, and production could increase 3 percent to 335 million pounds.

Returns above cash costs to stock ewe operators were close to breakeven in 1988, after averaging \$24 to \$28 per ewe during 1985 through 87. Further declines in net returns are expected in the coming year as production costs rise modestly and larger lamb supplies pressure prices lower.

The chance that profits could turn negative is not expected to affect producer expansion plans immediately. However, it could temper further increases into the 1990s.

Hogs

Pork supplies in 1989 are forecast at nearly 64 pounds per capita (retail weight), about the same as in 1988. Commercial pork

production likely will rise above 1988 in the first half of the year, but fall below in the second half.

Retail pork prices may average 1 percent to 3 percent higher in 1989. Barrow and gilt prices could average in the \$42 to \$48 per cwt range, compared with 1988's \$43. Year to year price increases are likely to be greatest in the fourth quarter.

Hog producers expanded inventories about 14 percent between mid-1986 and mid-1988 in response to positive net returns. Expansion slowed in mid-1988 as drought pushed feed costs substantially higher and hog supplies drove prices lower, resulting in returns to hog producers below breakeven in the last several months of 1988.

Production costs are expected to rise further in 1989, mostly because of increased feed costs. Although grain prices should decline in the second half if crop conditions are normal, average breakeven prices for hogs for the year could be at least \$5 higher than in 1988. Since hog prices are expected to raise only slightly, on average, returns to producers likely will decline. Returns over all costs could be negative throughout most of the year. Consequently, breeding inventories could continue to decline in the first half of 1989.

However, it is not likely that a major herd liquidation has begun. Liquidation in 1988 may have been concentrated among smaller producers, who generally have higher production costs per cwt. Larger producers, whose output tends to be more stable, may have maintained their herds. Favorable crop conditions and a stable economy in 1989 likely would result in renewed expansion of hog inventories, possibly beginning in early 1990. Pork production, thus may hold fairly steady through 1990, and then trend upward.

Poultry

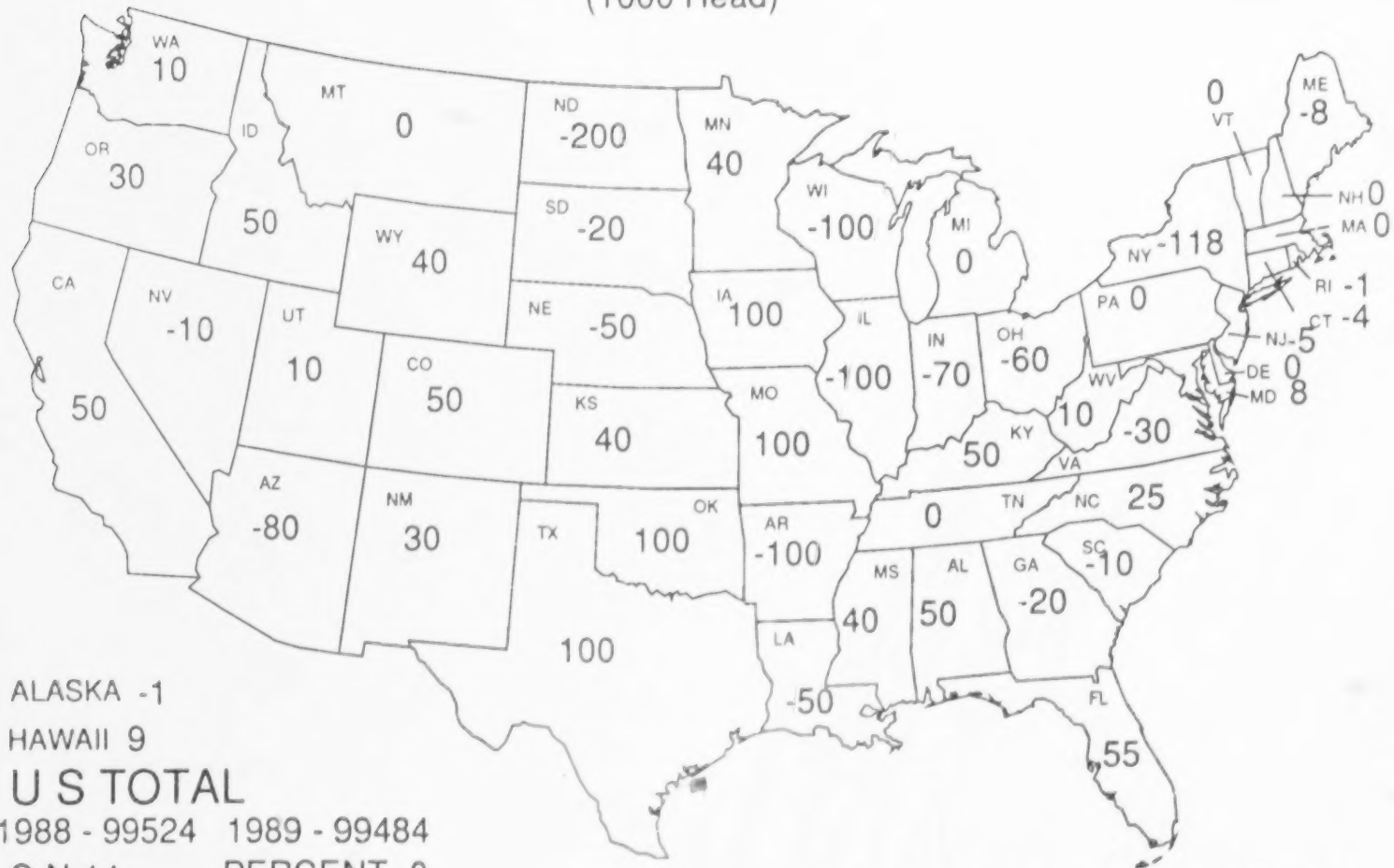
Broiler and turkey production are forecast to continue rising in 1989, based on expectations of positive net returns. Broiler prices in 1989 may be supported by decreases in domestic supplies of high-value beef and ground meat. Disappearance of red meat and poultry is expected to fall around 2 pounds per person in 1989, following 1988's record per capita consumption of about 220 pounds (retail basis).

Although Wyoming does not have a commercial poultry industry, broilers and turkey are strong competitors with the red meat industry. The large supplies of lower priced poultry products dampen the price prospects that otherwise would be expected by livestock producers. Per capita poultry consumption for 1989 is forecast at 81.7 pounds, exceeding beef's 68.6 and pork's 63.6 pounds.

*Robert D. Carver
Extension Economist
University of Wyoming*

CHANGE IN TOTAL CATTLE NUMBERS 1989 - 1988

(1000 Head)



ALASKA -1

HAWAII 9

U S TOTAL

1988 - 99524 1989 - 99484

C-N-14

PERCENT -0

2/14/89

WESTERN LIVESTOCK MARKETING INFORMATION PROJECT

Job Openings Outlook

FLORAL DESIGNERS

Floral designers create and prepare floral arrangements using fresh, dried, or artificial flowers and greenery. Floral arrangements must be appropriate for the event and meet customer's preference for color and type of flower, delivery, and cost. Depending on the size of the shop, floral designers may perform a variety of duties other than arrangement. They may sell, clean and preserve flowers, take phone orders, and monitor supplies. They must know about the plants they sell and be able to explain flowering habits and growing conditions to customers to help customers choose flowers and plants. Those who manage or own shops also order supplies, set prices, and train employees.

Floral designers must have the stamina to work standing for long periods of time and the strength to lift containers of flowers weighing up to 40 lbs. They must have good color vision, an eye for detail, a sense of balance and proportion, manual dexterity, artistic ability, persistent, ability to communicate ideas visually, pleasant personality, and a neat appearance. Floral designers usually work eight hours a day, Monday through Saturday having a day off during the week. They work longer hours during holidays and periods when there are many weddings and funerals. The busiest season is November-May. Work areas are often cool and humid to preserve the flowers.

Some floral designers are trained on the job. For trainee positions a high school diploma is desired, but not necessary. Some employers prefer applicants who have formal training in design. A few colleges and universities offer degrees in floristry and floriculture with emphasis in flower marketing and shop management. Private trade and technical schools also teach floral design.

This is a medium occupation employing about 280 in Wyoming. There is a seasonal increase of employment during the holidays. Entry wage for trainees is about \$3.35 per hour. Beginners usually need one to three years of training before advancing to a higher position. Those with some experience earn slightly more. Experienced floral designers earn between \$4.00-\$5.00 per hour, depending on the person's speed and skill, shop location and size. Earnings of self-employed floral designers depend on business ability and talent, but are usually higher than that of salaried designers.

There is a shortage of qualified floral designers. This occupation has limited opportunities for advancement and relatively low pay which restricts the supply of suitable applicants. As a result, finding a job as a floral designer should be relatively easy.

SHOE REPAIRERS

Shoe repairers fix and rebuild shoes. Tasks include attaching soles and heels using cement, nails and sewing machines. They stretch shoes or build up portions of shoes for orthopedic purposes. They also repair belts, luggage, purses, and other products made of canvas, leather, or plastic.

Shoe repairers need above average manual dexterity; and average spatial and form perception and eye-hand coordination. They also need good color vision and mechanical aptitude. Many of the smaller shops are crowded and noisy. Shoe repairers usually stand a great deal. They often work six days a week.

Employers report that a high school diploma is the minimum educational requirement. Vocational training or training in high school industrial arts is helpful for entry positions. Employers like applicants who are able to meet the public.

This very small occupation in Wyoming employs about 220 repairers. Most repairers are self-employed. Wages vary with employer and size of shop. On-the-job trainees start at about \$4.00 per hour. Average wage with experience is \$5.75 per hour. Depending on the volume of business, some shoe repairers can earn more.

Outlook depends upon consumer demand for shoe repair and availability of training opportunities. Sources report that as the price of new shoes continues to rise, the demand for repairing old shoes will increase.

Shoe repairers must have the ability to use and maintain equipment and tools. They must possess an understanding of materials and shoe construction and be knowledgeable about all aspects of shoe repair such as taking shoes apart, cleaning, dyeing, and finishing. Courses in business management and bookkeeping are useful for those who want to open their own shop.

In Wyoming, repairers typically begin their career as helpers and learn their skills through informal on-the-job training. The length of training varies greatly with the individual. Training can last from six months to one year. Some mechanical ability is helpful. Vocational training programs are available nationwide. For more information on training opportunities, contact: Shoe Service Institute of America, 154 W. Hubbard St., Chicago, IL 60610.

For more information, contact the Wyoming Career Information System (WCIS), P.O. Box 3808, Laramie, WY 82071, (307)766-6533 or 766-6189.

Suzanne McGuire
Research Assistant, WCIS

Wyoming Coincident Indicators Index

The third quarter 1988 seasonally adjusted Wyoming Coincident Indicator Index (WCII) continued to hold at a level maintained now for nine quarters since mid-1986. For this nine-quarter period the index has been quite stable and shows a very slight upward trend. The WCII is derived using several economic variables which tend to change coincidentally with the overall Wyoming economy. The index is computed quarterly by the Division of Research and Statistics, Department of Administration and Fiscal Control.

The WCII is composed of four variables which are: 1) total State employment, 2) total wages reported for the quarter, 3) total sales and use tax collections, and 4) an industrial index. The industrial index is a composite of variables which represent three important Wyoming industrial sectors. For the industrial index, mining is represented by the number of active oil well drilling rigs; the agricultural sector is represented by an index of prices received for all Wyoming agricultural commodities; and tourism is represented by the total volume (in gallons) of motor fuels plus gasohol sold.

An annual comparison of seasonally adjusted values (third quarter, 1988, to the third quarter, 1987), shows a decline for employment and the industrial index components which are off 0.9 and 0.4 percent respectively from the previous year. The other two variables are up from the third quarter of 1987 with total reported wages registering an 11.6 percent increase and total sales and use tax collections a 5.3 percent increase. The 0.4 percent decrease in the industrial index is due to a 6.8 percent decrease in the oil drilling rig count and a 4.2 percent decrease in gallons of motor fuels plus gasohol sold. The agricultural commodities price index is up by 4.6 percent, but is overshadowed by the declines in the other two components of the industrial index. Overall the third quarter 1988 index is up from the third quarter of 1987, by 1.3 percent.

On a quarterly basis, the third quarter 1988 seasonally adjusted WCII is down by 0.8 percent from the second quarter of 1988. Three of the four variables are down. The industrial index is up by 2.6 percent, but total employment is down 2.8 percent, total reported wages are down 1.8 percent, sales and use tax collections are down 1.2 percent. Changes for the three component variables of the industrial index are mixed. The oil drilling rig count is up 13.6 percent; the agricultural commodities price index is up 4.2 percent; and total gallons of motor fuels plus gasohol sold are down 7.3 percent.

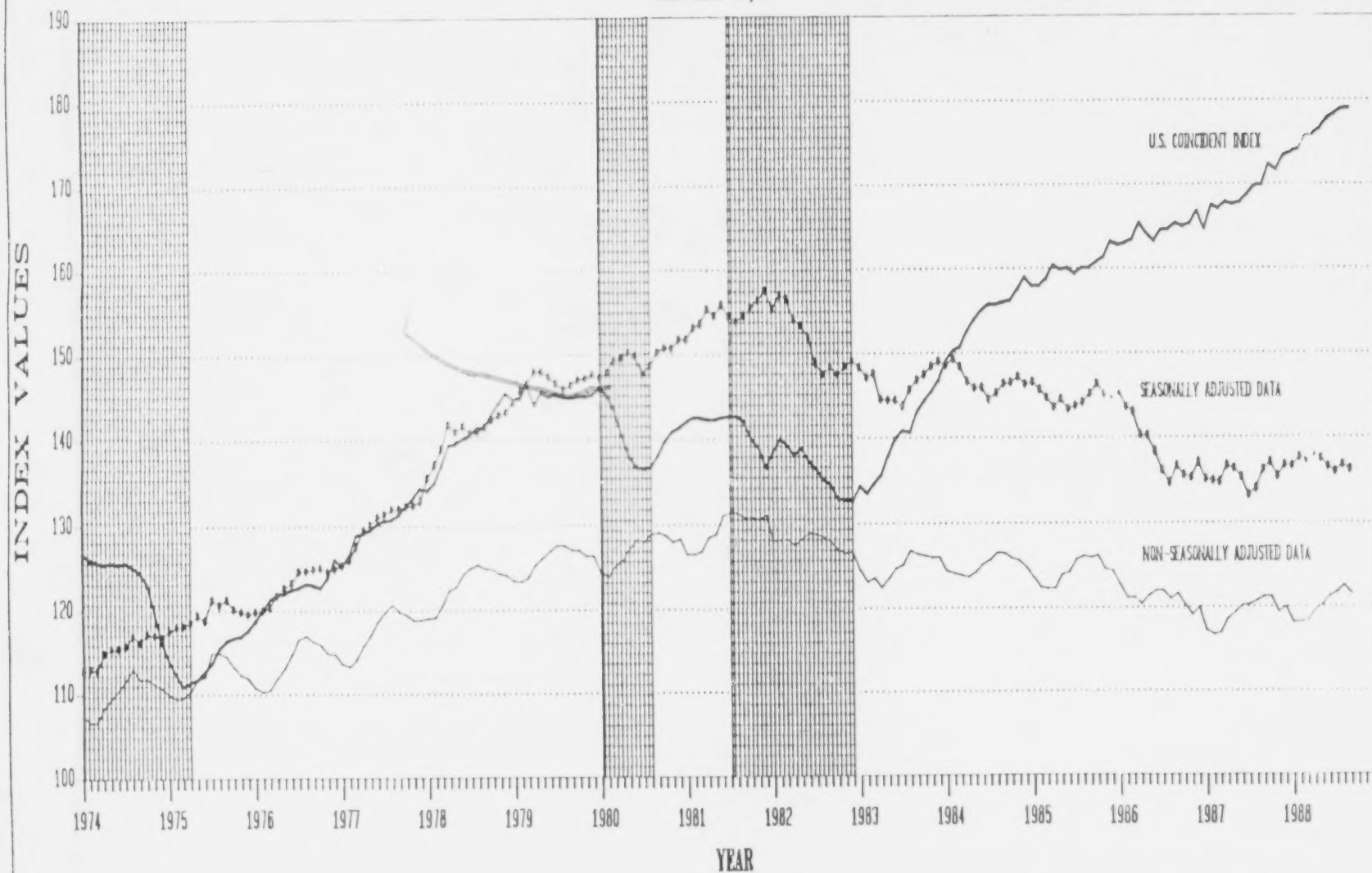
The seasonally adjusted WCII has now held at a stable level for over two years with indications of a very slight upward trend. Even though the index has slipped very slightly the last two quarters it continues to look as if the economy has reached the bottom of an economic cycle and may actually be slowly starting to advance. The industrial index is down 0.4 percent from the previous year mostly due to weakness in oil well drilling activity. Employment is also down almost 1 percent from the previous year, but on the encouraging side, total reported wages and total sales and use tax collections registered very strong gains. Overall the index is up a significant 1.3 percent. On the cautionary side, the overall WCII did register its second straight quarter to quarter drop, and continued weak oil prices in the fourth quarter will have a negative effect on the fourth quarter index.

Early signals for the fourth quarter of 1988 indicate that the overall WCII will slip even further, though it should remain in the same range as it has been for the past nine quarters. On a year-to-year basis, employment may be about even with the previous year level. Sales and use tax collections are down 5 percent based on October and November data. The industrial index will be down because the oil drilling rig count is down 49 percent and the agricultural commodities price index is only up 13 percent. On a quarter-to-quarter basis, the results look about the same. Employment is up 3 percent from the third quarter, based on data for October and November. The industrial index will be down with the oil rig count down 34 percent and the agricultural commodities price index up 5 percent. Sales and use tax collections are down 2 percent from the third quarter, based on data for October and November. All changes refer to seasonally adjusted data.

Steve Furtney, Economist
Wyo. Dept. of Administration
and Fiscal Control (DAFC)

WYOMING COINCIDENT INDICATORS INDEX: JANUARY 1974 - SEPTEMBER 1988

JANUARY 20, 1989



SHADDED AREAS REPRESENT U.S. RECESSIONARY PERIODS.

FEATURE ARTICLES

Wyoming Public Opinion:

The Economy and Politics, 1972-1988

The 16 years between 1972 and 1988 have been times of tumultuous change in Wyoming. The decade of the 1960s was a period of economic stagnation in the state. The economy was in the doldrums and population growth was nearly matched by persons leaving the state. As the decade closed both Governor Stan Hathaway and the legislators expressed grave concern about the lack of economic growth and the consequent lack of opportunity for young Wyomingites. Many, if not most, of those seeking work for the first time found they were forced by economic circumstances to leave the state.

The Arab oil embargo transformed Wyoming. Population increased by over 40 percent during the 1970s and, thanks to the mineral extraction industry, the economy boomed as never before. Average income in the state shot from below the national average to among the very highest in the United States. Protecting the environment and lessening the deleterious impact of growth became the most salient political issues. Funds flowed into the state treasury at an unsurpassed rate. And, although Wyoming has experienced other boom and bust cycles, during the late 1970s and early 1980s, virtually no one whether in business, government or academia could conceive of a scenario in which the population and economic growth would end.

The rapid decline in oil prices from over \$30 a barrel to a price which, at one point, was below \$10 a barrel had a catastrophic impact on the state's economy. In addition, the collapse of the nuclear power industry virtually wiped out the state's uranium industry. Wyoming's only iron ore mine closed and agricultural prices plummeted. Every measure of economic misery rose. The population of many cities fell even more rapidly than it had risen. Jeffrey City was nearly extinguished while the abandoned store fronts in Rawlins, Lander, Casper and Sheridan mocked the optimism of the boom.

Wyoming now has the nation's slowest growing economy. Comparatively Wyoming average personal income worsens each year. And as in the 1960s, migration from the state equals, if not surpasses, population growth.

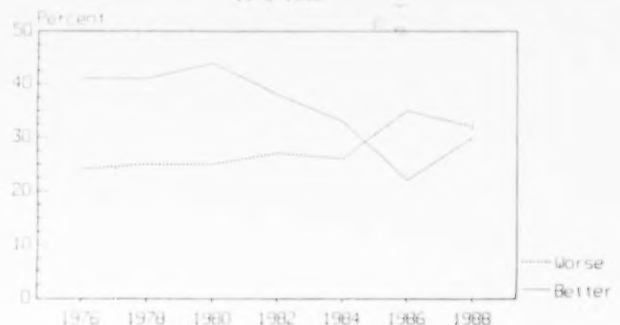
In sum, the past 17 years have not been times of placidity and one would expect there to be significant changes in the attitudes and beliefs of Wyoming's people. Data gathered by the Wyoming Election Year Survey (WEYS) allows us to examine public opinion during this turbulent period of the state's history. The Wyoming Election Year Survey was initiated prior to the 1972 General Election. In that year the political scientists associated with the Government Research Bureau interviewed 868 Wyomingites on a wide range of political issues. The survey has been conducted prior to every general election since the first survey. The

WEYS is one of oldest continuous statewide surveys in the United States.

Although most questions in the survey pertain to issues salient to a specific election, the WEYS has a core set of questions that have been asked at several points in time. This allows us to chart trends in Wyoming political, social and economic attitudes and these trends will be the subject of this paper.

Let us first examine perceptions of the economy since it has been the economy that has created the swirl of events. From 1976 to the present, the WEYS has included the following item: "We are interested in how well people are getting along financially these days. During the last few years, has your financial situation been getting better, getting worse or has it remained the same." Figure 1 charts personal assessment of financial condition. Only the percentage of persons believing their financial situation is improving or deteriorating has been included on the graph. The assessments of personal economic well-being clearly follow the boom and bust. From 1976 to 1980 slightly over four out of ten Wyomingites estimated that their financial situation was improving while only one in four estimated that their situation had worsened. But between 1980 and 1986 there was a 22 percent drop in the judgment that personal financial situation had improved while conversely there was a 10 percent increase in belief that personal financial situation has become worse. In 1986, at the height of the depression, negative assessments surpassed positive.

FIGURE 1
PERCEPTION OF FINANCIAL CONDITION
OVER THE PAST YEAR
1976-1988

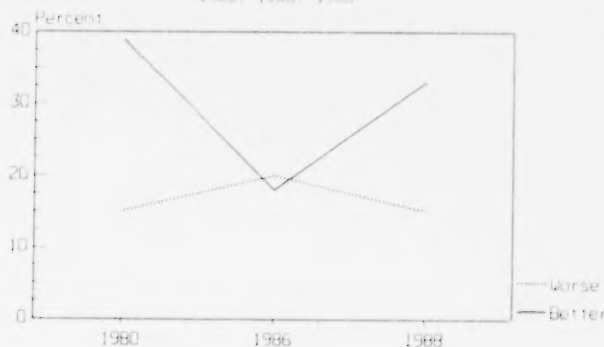


However, although most economic indicators have not significantly changed direction, personal appraisal of economic conditions have sharply improved over the past two years. The

percentage of those believing that their financial condition was better expanded by eight percent while the number of those experiencing worsening financial conditions, decreased slightly. By the time the October 1988 survey was conducted, nearly as many Wyomingites believed their lot was improving as believed it was becoming worse.

An even more dramatic reversal can be found on a question which asked respondents to predict their future economic well-being. In 1980, 1986 and 1988, respondents were asked: "Looking ahead to the next year, do you think your financial situation will get better, get worse or stay about the same." There is a remarkable 19 percent decrease in optimism between 1980 and 1986. But the increase from 1986 to 1988 of nearly 15 points is just as striking (Figure 2). On another question, respondents who believed that Wyoming's economy had gotten worse in the past year declined from 87 percent in 1986 to 61 percent in 1988. Additionally, in 1986 slightly over one-half the persons we interviewed believed that there was no chance that they would be laid off. In 1988, this figure had increased to just over 64 percent. Thus, the middle years of the 1980s were years of despair but the economy appears to have turned around in the minds of Wyoming citizens. Whether such optimism is baseless is yet to be determined.

FIGURE 2
PERCEPTION OF FUTURE FINANCIAL CONDITION
1980, 1986, 1988

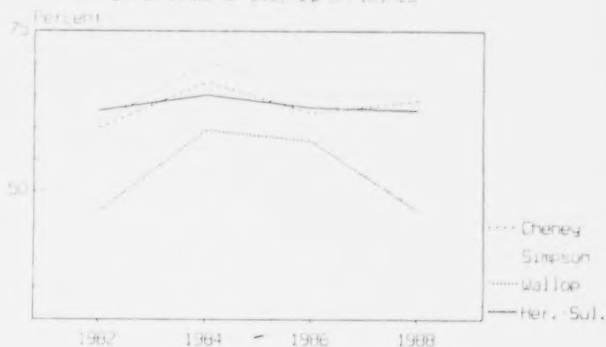


If politics is not simply a reflection of economics as the Marxists believe, most would agree that there is a high degree of covariance. In American history, some of our most profound political changes can be tied directly to economic changes. Perhaps the best example is the Great Depression of the 1930s. Nationally, the dominant Republican party was pounded into minority status. And in Wyoming the Democrats won all major state offices and secured majorities in both houses of the state legislature. Whether deserved or not, the Republican party was blamed for economic calamity and the Democratic party benefited by becoming the dominant national party. But strangely incumbent political leaders have not been blamed for the Wyoming depression of the 1980s. Many observers would argue that the depression of the 1980s is not substantially

less severe than that of the 1930s. Yet a Democrat has held the office of Governor for 20 straight years, the Republican congressional delegation has remained intact, and the Democrats are as far from a majority in the legislature as they were in the late 1970s.

Figure 3 presents the results of questions on surveys from 1982 to 1988 designed to measure popularity of the state's major political office holders. The extraordinary feature of these data is the lack of impact resulting from the economic depression. Note how flat the trend line is for the two Democratic governors. Apparently few held the Democrats responsible for economic disaster. Nor do we find much evidence that Senator Alan Simpson or Representative Dick Cheney have been adversely affected by the economic events of the past six years. Only for Senator Malcolm Wallop is much variation apparent and whether this is the result of economics or the savage attacks of his opponent in the 1988 election, John Vinich, is debatable.

FIGURE 3
PUBLIC ASSESSMENT OF THE JOB
PERFORMANCE OF ELECTED OFFICIALS



In 1988, we also asked respondents to indicate who they believed was to blame for the economic collapse. Table 2 gives the results of this question. Eight percent gave state government as an answer but this figure is minute when compared to the other perceived culprits. Clearly Wyomingites believe that the depression is not the fault of Wyoming political leaders.

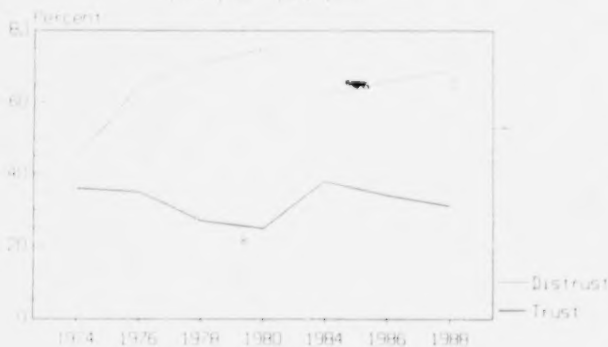
Table 2: Assessment of Blame of
Wyoming's Economic Difficulties

	Percent
Oil industry	24
The federal government	16
OPEC	13
World oil market	9
State government	8
Mineral industry	8
The United States as a whole	5
Congress	3
Ronald Reagan	2
Other	12

But if Wyomingites did not attribute blame to their elected representative for the collapse of the economy, one might have expected that their trust in the Federal government would be severely undermined. Certainly, it would have been possible for the federal government to lessen the depression's impact by stabilizing oil prices or by not permitting the destruction of the uranium extraction industry. However, to do so on a national level would have required policies contrary to the Reagan administration's laissez-faire ideology and, undoubtedly, contrary to majority public opinion in the United States. And thus Wyoming bore the full brunt of forces largely beyond its control.

Distrust of the federal government has long been a principal item in Wyoming political debates. The extent of this distrust can be measured using an item included in the WEYS since 1974. This question reads: "How much of the time do you think you can trust the federal government in Washington to do what is right? Would you say just about always, most of the time, some of the time or none of the time?" Figure 4 provides the answers to this question. For the sake of presentation, the "Just about always" and "most of the time" are considered to be trusting responses while "some of the time" and "none of the time" are defined as distrust.

FIGURE 4
TRUST IN THE FEDERAL GOVERNMENT
1974-1988

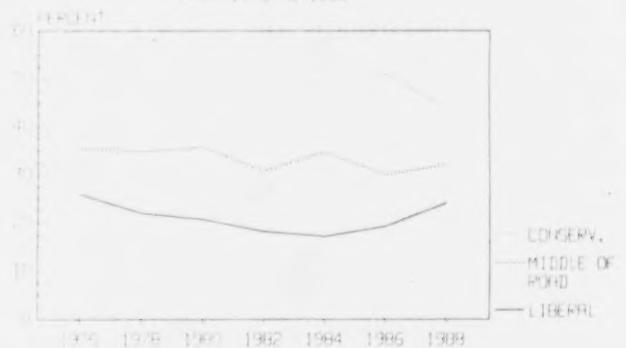


Three features of this graph deserve note. First, across the entire period Wyomingites were very distrustful of the federal government, a finding that should not surprise even the casual observer of Wyoming politics. Second, distrust of the federal government is obviously related approval of the President. Distrust was highest when Jimmy Carter was President and lowest in the 1984 and 1986 surveys when Ronald Reagan was President. Third, trust in the federal government has fallen a significant amount since its high point in 1984. A portion of this trend may, of course, be due to the Reagan Administration scandals but in our surveys, President Reagan's popularity has remained very high. Thus one must conclude that the depression has taken its toll on the trust levels found in 1984.

If Wyoming's political leaders have not been harmed by the depression, what has been its

impact on more fundamental political attitudes such as ideological and party identification? First let us examine political ideology. Since 1976, WEYS respondents have been asked to place themselves on a seven point ideological scale running from extremely liberal to extremely conservative. Results from this question can be found in Figure 5. Conservatives, of course, far outnumbered liberals throughout this period but change did occur. The percentage of liberal identifiers declined steadily from 1976 to 1984 but in 1986 and 1988 liberal identification increased and is now nearly as high as it was in 1976. Conservative identification reached its high point in 1986 but suffered a six point drop in the 1988 survey. Arguably one can attribute this alteration to economic turmoil.

FIGURE 5
IDEOLOGICAL IDENTIFICATION IN WYOMING
FROM 1976 TO 1988



Party identification is a concept formulated and operationalized by University of Michigan political scientists in the late 1940s. Party identification is generally the best predictor of voting behavior and is a reasonably good indicator of political attitudes. This is not to say that the party identification variable can predict with unerring accuracy. In numerous elections a salient political issue or a candidate's personality will override party considerations. And, although Democrats as a whole are more liberal than Republicans, exceptions are legion. Still no other characteristic can tell us as much about state politics as the distribution of party allegiance.

The question which measures party identification reads as follows: "Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent or what?" Those identifying with a party are then asked whether they are strong or weak Republicans or Democrats and those identifying as independents are asked if they are closer to one of the parties. To clearly show trends in Wyoming, all Republicans and Democratic identifiers have been grouped.

Nationally the distribution of party identifiers has remained relatively stable for the forty years. But there has been substantial movement in Wyoming during the past 18 years.

Probably as a result of the Watergate affair, Democratic identifiers slightly outnumbered Republicans in 1974 but Democratic identifiers decreased in every subsequent survey until 1988. The percentage of Republican identifiers rose quite steadily until, in 1984, nearly six out of ten Wyomingites identified as members of the GOP. At this point Wyoming had one of the highest, if not the highest percentage of Republicans identifiers in the United States (Figure 6).

FIGURE 6
PARTY IDENTIFICATION IN WYOMING
FROM 1972-1988



The Great Depression of the 1930s resulted in major changes in party allegiance. Has a similar change taken place in Wyoming? As can

be seen in Figure 6 some change coincident with the depression has occurred. In 1984, the Republicans had a 25 percentage point advantage. By 1988, this gap had been reduced to about 18 percent.

In sum, both liberals and Democrats have some reason to be optimistic because the trend toward greater conservatism and Republicanism has been reversed. However, conservatives and Republicans could argue that they have weathered the depression storm fairly well since Republicans and conservatives are far more numerous than their ideological and party counterparts.

In conclusion, we have examined Wyoming political attitudes and beliefs over an 18 year period, a period which has seen greater economic change than in any period in Wyoming history. Wyomingites are again relatively optimistic about their economic future. They apparently believe their political leaders have little influence over their economic well-being, at least Wyoming's political leaders are not blamed for the economic failure. Distrust in the federal government, however, appears to be increasing. Finally, the boom period was marked by substantial increases in conservative the Republican identification. This trend has been modified if not totally transformed, a change which has coincided with the economic depression.

*Dr. Oliver Walter, Head
Political Science
University of Wyoming*

The Wyoming Small Business Development Center Network

The Wyoming Small Business Development Center Network began serving the small businesses of Wyoming in March of 1985. It began in one room on one college campus with two employees. The Network now has eight centers across Wyoming through the seven community colleges and the University of Wyoming. Any small business, generally defined as less than 500 employees and not dominant in its field, may apply for management counseling assistance from the WSBDC.

Although 60 percent of the Network's clients are start-up businesses, a great deal is offered to longer-term businesses as well. The centers are known for their work in helping businesses design business plans to be used for management organization and financing. However, the centers also have a great deal to offer in other areas such as marketing, record keeping formats, personnel, procurement, customer relations, and other management topics.

A new program offered by the WSBDC enables Wyoming inventors to have their concepts evaluated by the federal experts at the National Institute of Science and Technology. Although currently focused on energy-related inventions, it is likely that the program will soon be expanded to include non-energy related inventions. Inventions accepted by NIST receive a letter of evaluation and possibly a full-scale analysis of their potential. A small percentage of the inventions reviewed are eligible for federal grants which provide funding for further development, testing and marketing. The service is at no cost to WSBDC clients (as is the case with all WSBDC counseling services). The Wyoming SBDC is one of only eleven SBDC's in the United States chosen to participate in the NIST program.

In addition to counseling over a thousand clients annually, the WSBDC Network produces about 200 seminars each year. The seminars and classes last from two hours to a day or more in length and address timely management and organizational topics. Some of the better-known training titles offered are: Wyoming SUPERHOST! hospitality training; the Governor's Entrepreneurship Conference and Inventor's Fair; The Wyoming Women's Symposium; the Northwest Ag. Symposium; the Small Business Clinic; the One Minute Manager; and many other management topics.

Funding for the WSBDC Network is provided by the sponsoring community colleges/university; the U.S. Small Business Administration, and the State of Wyoming through the Community College Commission.

In 1988 the two main topics of counseling for small businesses were business start-up information, and sources of capital. The third most popular counseling topic was marketing and sales techniques, followed by government

procurement, record keeping procedures, financial analysis, inventory control, personnel, computer usage, and international trade.

The main types of businesses counseled by the Network in 1988 were (in descending order) service, retail, manufacturing, construction, and wholesale. It is not surprising that the service sector occupies the largest (approximately 40 percent) segment of the WSBDC client base. Many service businesses require far less capital outlay than do other types of businesses, and therefore are a little easier to start and sustain in marginal economic times. The manufacturing sector only comprised about 15 percent of the WSBDC clients, which is also not too surprising, as many types of manufacturing businesses require large expenditures for capital, equipment and inventory items. Finding funding for such ventures in a down economy is difficult unless markets are extremely firm and a great deal of owners equity is provided to secure the funding. Manufacturers, however, are a targeted group for WSBDC counseling assistance, as a vital, growing manufacturing sector can help to pull Wyoming out of its recession, and will also help the U.S. reduce its trade deficit.

Types of Businesses Counseled FY 1988



SMALL BUSINESS SURVEYS

Six of the eight WSBDC Centers performed Needs Assessment Surveys of their business communities in 1987 - 88 to determine interests and needs for seminars, conferences, classes, and workshops. Centers performing the surveys were Northwest Community College, Eastern Wyoming College, Laramie County Community College, Casper College, the University of Wyoming and Central Wyoming College. Interesting trends were established which reveal some of the characteristics of the Wyoming small business populace and its preferences.

In general management topics, time management was most requested as a desired training topic. Learning more about stress was also repeatedly requested, along with personnel topics and improving communications skills.

A great deal of interest was indicated in computer topics with wide ranging interests from accounting and record keeping to inventory control and word processing training.

Business plans, their development and use, continue to be of great interest to clients. This is not surprising as they are a requisite for almost any type of equity or debt financing.

Marketing topics have traditionally interested the businesses of Wyoming. The surveys indicate that more promotion, media mix strategies, budgeting and analysis information is desired.

Financial management is another traditional area of interest which is holding. Cash flow projections, current tax information, and budgeting, are requested topics for classes and seminars.

In the accounting area much interest was shown in learning more about costing and pricing principles. Record keeping techniques were also heavily requested. Learning more about accounts receivable and accounts payable methodologies was also requested.

Some interest was also indicated in receiving more education in miscellaneous topics such as: customer relations, estate planning, contractual principles, and learning more about business formats (corporations, partnerships, proprietorships).

Although only some of the WSBDC group training activities are held at night, the surveys indicate that most of the clients responding strongly preferred evening classes and seminars. Length of training preferred is two hours and growing interest is indicated in "series" format such as a progressive "mini-course" of four or five sessions, two hours each. The mini-course format has been used with success by several centers.

Summarizing this data would lead to the conclusion that the businesses of Wyoming are very specific in their perceived needs. They

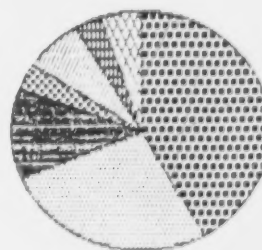
acknowledge the wisdom in developing a good business plan. They are sensitive to the need for a sound approach to marketing. They want to learn more about how to make good financial projections and are desiring to remain updated on the impact of taxes on their businesses.

Not surprisingly, stress is becoming a topic of greater interest as times become leaner and more challenging. Improved communication techniques are also seen as one more way to help businesses operate more effectively, perhaps beginning inside the organization itself.

A good awareness of solid accounting practices is desired and interest in computerized accounting systems and office systems seems significant. Attending periodic refresher courses on these topics can be very helpful toward maintaining a successful, competitive business.

The businesses of Wyoming appear to be interested in enhancing their management skills and information baselines. That bodes well for our future, as our businesses strive to keep as up-to-date as possible.

AREAS OF COUNSELING - 1988FY



- BUSINESS STARTUP
- SOURCES OF CAPITAL
- MARKETING/SALES
- GOVERNMENT PROGRAM
- ACCOUNTING/RECORDS
- FIN. ANAL./COST CONT.
- OTHER

OTHER = INVENTORY, PERSONNEL, COMPUTERS, INTERNATIONAL TRADE

M.C. Bryant
State Director
Wyoming Small Business
Development Center

The Yellowstone Fires of 1988

An Analysis Based on Sales Tax Collections and Various Park Related Data

IMPACT OF YELLOWSTONE FIRES ON AFFECTED WYOMING COUNTIES AS INDICATED BY SALES TAX COLLECTIONS

Sales tax collections are a valuable revenue source to state, county, and local governments. When examined over time, they provide a valuable indication of economic growth and activity, both at the state and county level. Sales tax is shared between state government, which receives a two-thirds share, and the county of origin, which receives the remaining one-third share. Distribution of the county's share to the municipalities is based upon population. In addition to the state imposed 3 percent sales tax, counties have the option to impose: 1) a 1 percent sales tax which is returned to and utilized by the county through their general revenue fund, and 2) a 1 percent additional sales tax to be used only for the purpose of planning, construction, furnishing, and debt service for any capital improvement project (capital facilities tax). Since the two optional sales tax features provide "boosted revenue" on retail sales made within the county, the data were marginalized to reflect a consistent 3 percent state tax rate.

Due to the "lag" in collecting sales tax, the August through November period equates to sales actually made during mid-June through October. This particular time frame covers the period when the Yellowstone fires were active, and thus, "impacting" local economies in one way or the other. The counties identified in this report include Teton, Park, Sublette, and Fremont. The region referred to throughout the report, includes only the above four counties.

Overall, sales tax collections for the counties studied, the region, and the State as a whole, were up from the August through November period of 1987. The areas most affected were the Retail and Service related sectors. In reviewing the following data for these particular sectors, one surmises that the "impact" was generally of a positive nature instead of negative, in terms of taxable sales. The categories indicating negative response were the Building Materials and Furniture components of the Retail sector, and the Teton County Service sector as a whole. The counties responding most significantly (positive or negative) were Teton and Park. Sales activity in the Hotel and Lodging area (which includes campgrounds), along with General Merchandise stores appear to have responded positively.

On the premise that visitors were held rather "captive" in Jackson, Cody, and the surrounding area (due to park closures), and that thousands of firefighters were brought into the area (many staying for weeks, even months at

a time) the boosted sales tax figures are fairly understandable.

Logically, concessions inside Yellowstone were most adversely affected by the fire activity. Taxation boundaries within Yellowstone split the concession sales into Park and Teton counties. Therefore, a revenue shift appears to have occurred between the Yellowstone concessions and the respective county businesses outside the Yellowstone boundary.

In looking at the regional tax totals, several perplexing relationships exist. First off, the Service sector as a whole declined 8 percent from the year earlier; however, the lodging component within this sector improved by 24 percent. Secondly, Retail trade increased overall by nearly 6 percent, while the Eating and Drinking component within this sector realized only a 2 percent increase from a year ago. It would seem logical that the eating and drinking establishments would have seen a larger "boost" in sales activity than the 2 percent, especially when the lodging component increased to that extreme.

The following narrative is a brief synopsis of the sales activity (based on sales tax collections) in the four county region which were immediately affected by the summer fires.

Agriculture - increases in Teton (38.1 percent), Park (21.6 percent), and Fremont (17.7 percent) counties, while Sublette county indicated a 64.1 percent decline from year ago. It must be noted that agricultural related sales in Sublette county, for both years, were insignificant. Regionally, agricultural related sales increased 33.1 percent from 1987, while the State total showed an increase of 22.2 percent.

Mining - sales activity was slower than a year ago in all of the counties studied, except in Sublette, which realized a 25.3 percent increase from a year earlier. Although most likely unaffected by the fires, declines were reported in Fremont (-33.1 percent), Park (-10.3 percent), and Teton (-.6 percent) counties. Regionally, mining sales declined 18.5 percent, while the State, inversely, realized a 35.2 percent increase from the same time one year ago.

Construction - sales were up in all instances. Teton county increased 38.8 percent above a year earlier, followed by Park (25.7 percent), Sublette (15.7 percent), and Fremont (4.8 percent) counties. Regionally, construction sales were up 25.2 percent, while Statewide sales in this sector were up 26.4 percent.

Manufacturing - significant gains were noted in all the counties reviewed. Teton county increased 46.4 percent from a year earlier, while increases of 23.3 percent (Park), 18.6 percent (Fremont), and 14.2 percent (Sublette) were seen around the region. The regional total was up 26.9 percent, while Statewide, sales increased 21.5 percent from a year earlier.

Transportation, Communications, and Public Utilities (T.C.P.U.) - sales increased in Park (27.6 percent), Teton (10.3 percent), and Sublette (6.9 percent) counties; however, declined 7.8 percent in Fremont county. Regionally, this sector increased 9.3 percent from a year ago, while Statewide sales increased 5.4 percent.

Wholesale Trade - increased in all but one county reviewed. Teton county increased most substantial, at 36.1 percent, followed by Sublette (30.5 percent), and Fremont (27.0 percent) counties. Park county showed a 6.7 percent decline in sales collections from a year earlier. Regionally, wholesale trade increased 17.4 percent, while Statewide sales increased 13.4 percent.

Retail Trade - Teton county increased in all components except the Furniture store category (-3.6 percent). Building Materials increased 37.6 percent, followed by Apparel

stores (17.5 percent). General Merchandise, Food, Automotive, and Miscellaneous stores realized increases of 3.9 percent, or better. Eating & Drinking establishments realized the least amount of increase, with .1 percent.

Retail Trade - Park county increased 7.4 percent from a year earlier. Categories that increased were General Merchandise (12.9 percent), Food (17.1 percent), Furniture (6.5 percent), Eating & Drinking establishments (5.9 percent), and Miscellaneous stores (8.7 percent). The categories that declined were Building Materials (-9.2 percent), Automotive (-3.6 percent), and Apparel stores (-1.2 percent).

Retail Trade - Sublette county increased 4.6 percent overall. Furniture stores (rather insignificant) increased 87.5 percent. General Merchandise, Automotive, and Miscellaneous categories all increased better than 26 percent over the previous year. Food and Apparel store categories increased 6.1 percent and 2.9 percent, respectively. The Building Materials and Eating & Drinking categories declined 16.7 percent and 3.7 percent, respectively.

Retail Trade - Fremont county increased 3.4 percent over 1987. The categories that increased were Automotive (19.0 percent), General Merchandise (10.7 percent), Apparel (4.9 percent), Eating & Drinking establishments (5.9

Table 3: Impact of Yellowstone Fires on Sales Tax Collections
Wyoming

	1987	1988	% Chg
Agriculture, Forestry, & Fisheries	\$ 148,003	\$ 180,856	22.20%
Mining	\$ 2,088,823	\$ 2,824,254	35.21%
Contract Construction	\$ 1,116,217	\$ 1,411,306	26.44%
Manufacturing	\$ 2,229,941	\$ 2,709,895	21.52%
Transportation, Communications, and Public Utilities	\$ 4,239,068	\$ 4,467,750	5.39%
Wholesale Trade	\$ 4,166,464	\$ 4,724,859	13.40%
Retail Trade	\$21,607,619	\$21,693,710	0.40%
Building Materials	\$ 1,915,603	\$ 1,774,210	-7.38%
General Merchandise	\$ 2,879,668	\$ 2,986,846	3.72%
Food Stores	\$ 5,449,881	\$ 5,221,429	-4.19%
Automobile Dealers/Service Stations	\$ 2,311,206	\$ 2,367,208	2.42%
Apparel Stores	\$ 958,794	\$ 1,009,824	5.32%
Furniture Stores	\$ 711,624	\$ 745,761	4.80%
Eating & Drinking Establishments	\$ 4,049,330	\$ 4,145,370	2.37%
Miscellaneous Retail Stores	\$ 3,331,513	\$ 3,443,063	3.35%
Finance, Insurance, and Real Estate	\$ 175,497	\$ 182,856	4.19%
Service	\$ 5,909,389	\$ 6,619,426	12.02%
Lodging - Hotels & Other	\$ 2,134,153	\$ 2,231,951	4.58%
Government	\$ 3,536,398	\$ 3,469,449	-1.89%
TOTAL	\$45,217,418	\$48,284,359	6.78%

percent), and Miscellaneous stores (4.0 percent). Furniture stores (-30.1 percent), Food stores (-1.8 percent) and Building Materials (.7 percent) all declined from a year earlier.

Retail Trade - increased by 5.6 percent within the region, while statewide, this sector was up only .4 percent from a year earlier.

Finance, Insurance, and Real Estate (F.I.R.E.) - increased in all counties reviewed. Fremont county increased 62.8 percent from a year earlier. Sublette increased 55.9 percent, while Park and Teton counties increased over 1987 levels by 29.4 and 11.8 percent, respectively. The regional total for this sector was up 12.4 percent, while Statewide the total increased 4.2 percent.

Service - three of the four counties increased: Park (7.2 percent), Sublette (5.3 percent), and Fremont (.8 percent). Teton county was off -17.6 percent from a year earlier. The regional total for this sector declined 8.1 percent, while Statewide the total increased 12.0 percent.

Hotel and Lodging (Service component) - increases were reported in three of the four counties. The largest increase in the lodging component was in Teton county (37.4 percent).

followed by Sublette (14.4 percent), and Park (7.6 percent). Fremont county lodging activity for the four month period declined 10.8 percent from a year earlier. Regionally, this component increased 23.9 percent from the previous year, while Statewide the total increased 4.6 percent over the 1987 total.

Government - collections were up in three of the four counties. The largest increase was in Sublette county, at 127.2 percent over a year earlier. Fremont county exceeded year earlier levels by 30.2 percent, followed by Teton county with an 8.3 percent increase. Park county declined 8.4 percent from the same time a year earlier. Regionally, the Government sector increased by 16.1 percent, while the State, inversely, declined 1.9 percent from a year earlier.

Visitor Analysis by Entrance Station- Yellowstone National Park

Total visitors to Yellowstone Park were off 15.3 percent from 1987 to 1988. Although the January through May total visitor number for 1988 was down 4.5 percent from a year earlier, the most significant declines were seen in August and September, when visitor numbers

Table 4: Impact of Yellowstone Fires on Sales Tax Collections
Fire Region

	1987	1988	% Chg
Agriculture, Forestry, & Fisheries	\$ 36,612	\$ 48,734	33.11%
Mining	\$ 169,570	\$ 138,145	-18.53%
Contract Construction	\$ 185,364	\$ 232,073	25.20%
Manufacturing	\$ 226,080	\$ 286,906	26.90%
Transportation, Communications, and Public Utilities	\$ 745,775	\$ 814,960	9.28%
Wholesale Trade	\$ 200,265	\$ 235,042	17.37%
Retail Trade	\$5,099,954	\$5,400,543	5.89%
Building Materials	\$ 425,062	\$ 452,058	6.35%
General Merchandise	\$ 758,383	\$ 834,539	10.04%
Food Stores	\$ 969,453	\$1,019,486	5.16%
Automobile Dealers/Service Stations	\$ 287,744	\$ 313,796	9.05%
Apparel Stores	\$ 231,400	\$ 255,500	10.41%
Furniture Stores	\$ 93,190	\$ 100,577	7.93%
Eating & Drinking Establishments	\$1,437,472	\$1,468,887	2.19%
Miscellaneous Retail Stores	\$ 897,250	\$ 995,700	6.51%
Finance, Insurance, and Real Estate	\$ 61,585	\$ 69,201	12.37%
Service	\$1,578,865	\$1,695,835	7.41%
Lodging - Hotels & Other	\$ 749,129	\$ 928,011	23.88%
Government	\$ 475,167	\$ 551,656	16.10%
TOTAL	\$8,779,236	\$9,473,095	7.90%

dropped off 30 percent and 51 percent, respectively, from those in 1987.

The South entrance suffered the most drastic decline in visitor numbers in 1988, at 25 percent below the previous year. From July 22 through September 17, 1988, the South entrance was closed a total of 26 days due to fire activity. Entrance closures created a standby situation for many visitors, as Park officials were not able to estimate the time of each entrance closure. Consequently, many visitors "waited out" the situation by alternately spending time in the Jackson Hole area.

The Northeast entrance was off 17 percent from 1987 in total visitors. From July 22 through September 17, 1988, the Northeast entrance was closed to visitors a total of 12 days, all of which were in the month of September. The outlying Montana communities of Silver Gate and Cooke City were the end of the road for many visitors wanting to see Yellowstone.

The East entrance visitor numbers fell 15 percent below year earlier figures. Closure due to fire activity during the July 22 through September 17 period amounted to five days, all of which were in September. Several lodges, including the famous Pahaska Teepee were threatened by encroaching fires; however, none reportedly sustained any damage. Although retail trade and service related businesses in Park county showed an increase over the previous year's season, outfitters and hunting lodges apparently suffered a loss.

The West entrance was closed to visitors only one day during the July 22 through September 17 period. However, total visitor

numbers were off over 13 percent from those recorded in 1987. The community of West Yellowstone, Montana was threatened several times last summer by approaching fires. However, due to its proximity to the Park, it seemingly would have benefitted, serving as the final stopover spot for visitors waiting to gain entrance into the Park.

The North entrance visitor numbers were off only 3 percent from 1987. During the period of July 22 through September 17, 1988, the North entrance was closed only two days, both of which were in September.

Visitor Days in 1988 - Yellowstone National Park

The number of visitor days for Yellowstone Park dropped 17.2 percent in 1988 as a result of the fires. Compared to 1987's total days of 1,141, the Park visitor days in 1988 were off 196 days, totaling 945.

Total lodging capacity in Yellowstone Park amounts to 2,536 units. Only one of the areas, Fishing Bridge, reported an increase in visitor days in 1988. Grant Village, with a total capacity of 299 units realized the greatest drop in days open, at -38.32 percent. This area, compared to the 1987 season, was closed 41 days out of the season. The Old Faithful Snow Lodge followed second in terms of percentage visitor days lost to the fires, dropping -33.7 percent from the previous season. The Lake Hotel and Old Faithful Inn were both off by better than 20 percent from the 1987 season in terms of days open to park visitation. The other areas of the Park felt impacts ranging from -18.8 percent all the way down to -3.1 percent.

Table 5: Yellowstone Lodging Dates

County	Location	# Units	Open	-1988- Close	Days	Open	-1987- Close	Days	% Chg Days
Park	Canyon	588	06/13	08/23	71	06/14	08/27	74	-4.05%
Park	Fishing Bridge	350	05/28	09/06	101	06/01	09/08	99	2.02%
Park	Grant Village	299	06/01	08/20	66	06/05	09/20	107	-38.32%
Park	Mammoth	220	05/28	09/09	104	05/23	09/08	108	-3.70%
Park	Roosevelt	80	06/04	08/29	86	06/07	09/08	93	-7.53%
Park	Totals	1,537			428			481	-11.02%
Teton	Lake Hotel	296	05/26	08/28	94	05/22	09/20	121	-22.31%
Teton	Lake Lodge	186	06/06	09/08	94	06/09	09/14	97	-3.09%
Teton	Old Faithful Inn	320	05/06	09/07	124	05/06	10/12	159	-22.01%
Teton	Old Faithful Lodge	132	05/25	08/28	95	06/02	09/27	117	-18.80%
Teton	Old Faithful Snow Lodge	65	05/20	09/07	110	05/19	11/01	166	-33.73%
Teton	Totals	999			517			660	-21.67%
	Grand Total	2,536			945			1,141	-17.18%

Table 6: Total Visitors to Yellowstone National Park 1986 - 1988
By Entrance Station

	North	West	South	East	Northeast	Total
Jan. 86	10,802	9,632	3,010	987	1,675	26,106
Feb. 86	10,910	14,711	3,312	578	1,553	31,064
Mar. 86	10,956	5,262	2,548	349	2,792	21,907
Apr. 86	11,479	10,197	0	0	1,446	23,122
May 86	39,914	54,266	30,452	22,924	3,377	150,933
Jun. 86	63,748	133,990	129,163	84,497	22,470	433,868
Jul. 86	90,612	223,487	187,699	128,502	40,783	671,083
Aug. 86	85,504	214,406	167,621	113,528	41,113	622,172
Sep. 86	54,971	106,541	68,958	55,261	14,763	300,494
Oct. 86	27,988	34,054	18,131	14,585	2,482	97,240
Nov. 86	933	2,460	977	1,383	1,342	7,095
Dec. 86	7,550	7,779	2,021	631	1,998	19,979
TOTAL	415,367	816,785	613,892	423,225	135,794	2,405,063

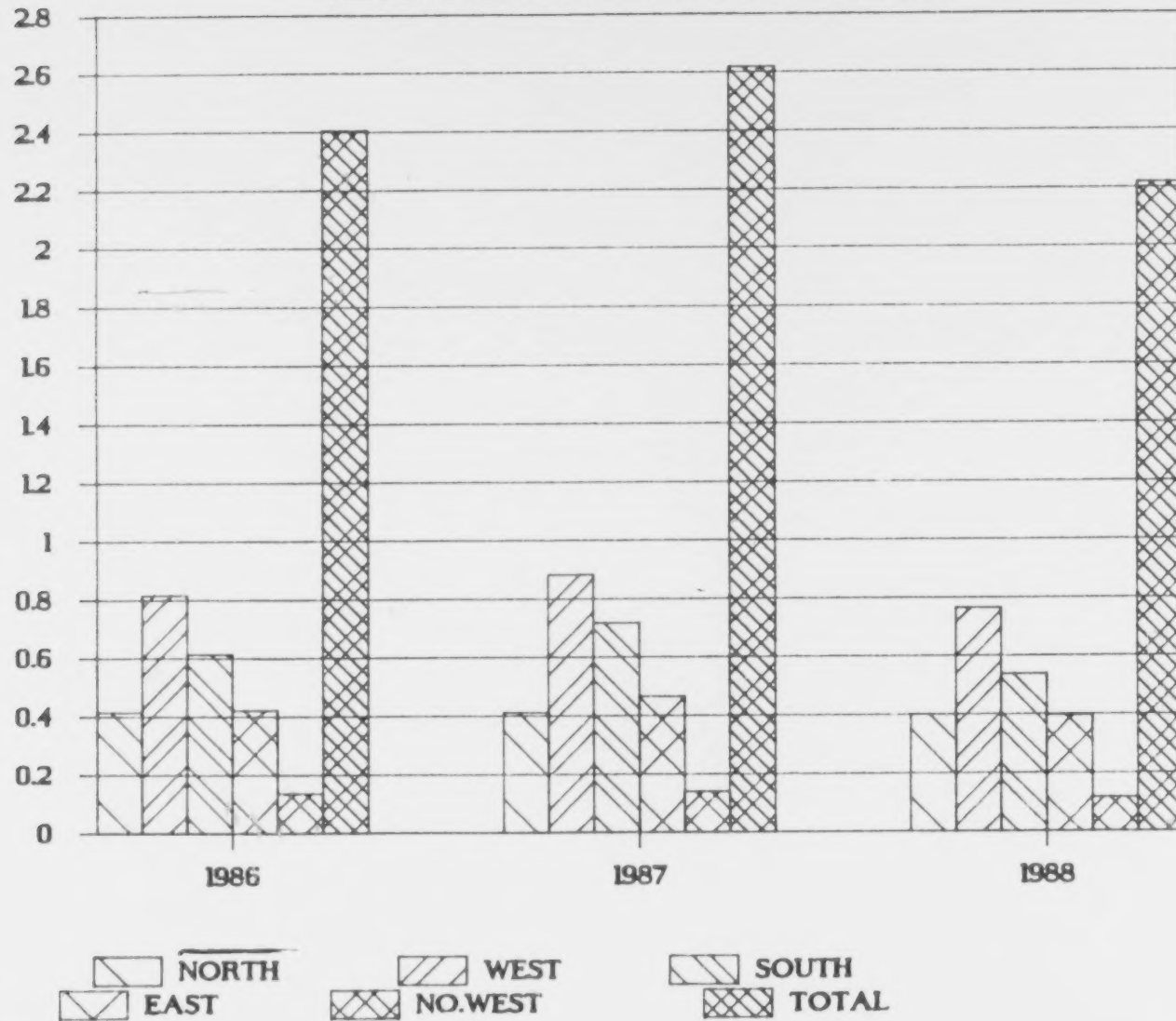
	North	West	South	East	Northeast	Total	% Change Previous Year
Jan. 87	9,881	12,486	3,775	1,239	1,937	29,318	12.30%
Feb. 87	9,160	17,379	4,249	1,470	2,120	34,378	10.67%
Mar. 87	2,441	5,704	2,906	397	1,857	13,305	-39.27%
Apr. 87	4,123	16,469	8,691	2,336	1,725	33,344	44.21%
May 87	34,046	64,841	51,448	34,275	5,768	190,378	26.13%
Jun. 87	61,978	144,149	134,908	90,404	24,836	456,275	5.16%
Jul. 87	96,581	225,332	202,517	129,014	39,032	692,476	3.19%
Aug. 87	89,658	206,823	183,924	115,801	37,265	633,471	1.82%
Sep. 87	61,058	129,619	93,492	63,502	19,200	366,871	22.09%
Oct. 87	28,261	45,687	26,673	22,129	2,847	125,597	29.16%
Nov. 87	7,925	5,604	2,901	3,754	1,200	21,384	201.40%
Dec. 87	7,707	9,017	2,464	481	1,963	21,632	8.27%
TOTAL	412,819	883,110	717,948	464,802	139,750	2,618,429	8.87%
% Change 86-87	-0.61%	8.12%	16.95%	9.82%	2.91%		

	North	West	South	East	Northeast	Total	% Change Previous Year
Jan. 88	7,423	12,680	4,208	1,162	1,965	27,508	-6.17%
Feb. 88	8,873	19,691	5,329	1,337	2,162	37,392	8.77%
Mar. 88	5,534	7,544	4,725	439	1,798	20,040	50.62%
Apr. 88	7,379	11,930	2,325	2,112	0	23,746	-28.78%
May 88	31,161	56,125	47,578	37,660	5,923	178,447	-6.27%
Jun. 88	64,168	130,885	140,288	90,478	21,830	447,649	-1.89%
Jul. 88	100,373	229,106	151,530	125,261	35,482	641,752	-7.33%
Aug. 88	7,592	158,147	93,526	89,768	26,743	445,776	-29.63%
Sep. 88	41,161	59,854	45,748	26,809	7,170	180,742	-50.73%
Oct. 88	42,160	65,569	37,483	20,075	9,732	175,019	39.35%
Nov. 88	8,404	4,854	3,489	1,616	2,024	20,387	-4.66%
Dec. 88	7,075	8,956	2,342	608	1,689	20,670	-4.45%
TOTAL	401,373	765,341	538,571	397,325	116,518	2,219,128	-15.25%
% Change 87-88	-2.77%	-13.34%	-24.98%	-14.52%	-16.62%		

Buck McVeigh, Economist
Wyo. Dept. of Administration
and Fiscal Control (DAFC)

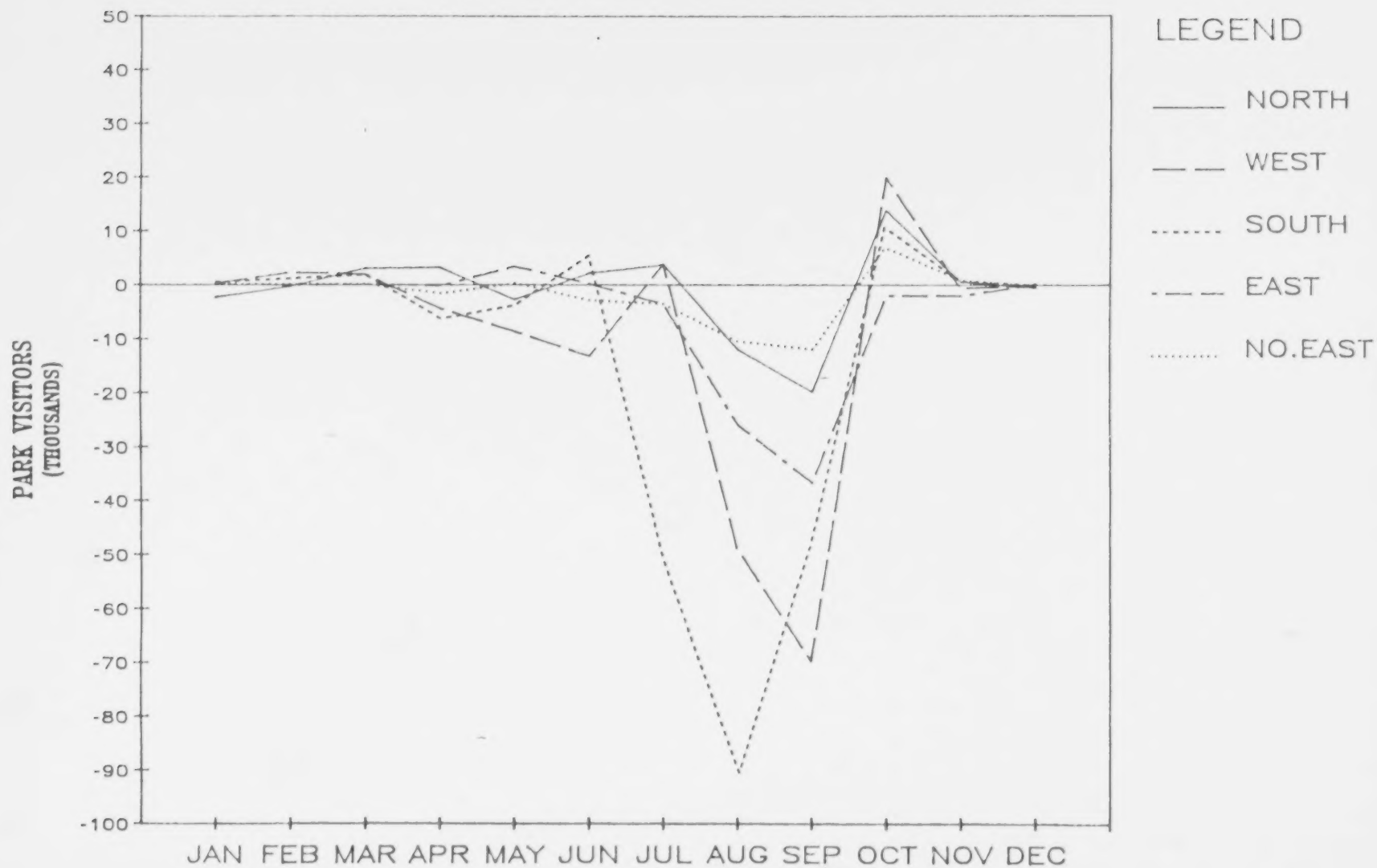
TOTAL ANNUAL TRAVEL BY STATION

YELLOWSTONE NATIONAL PARK 1986 - 1988



VISITORS
(Millions)

DIFFERENCE IN VISITOR NUMBERS 1987 - 1988
BY ENTRANCE STATION
YELLOWSTONE NATIONAL PARK



ECONOMIC CHANGES

ECONOMIC CHANGES

(Editor's note: The purpose of this section is to point out areas of Wyoming's economy in which noteworthy changes or trends developed during the latest reporting period.)

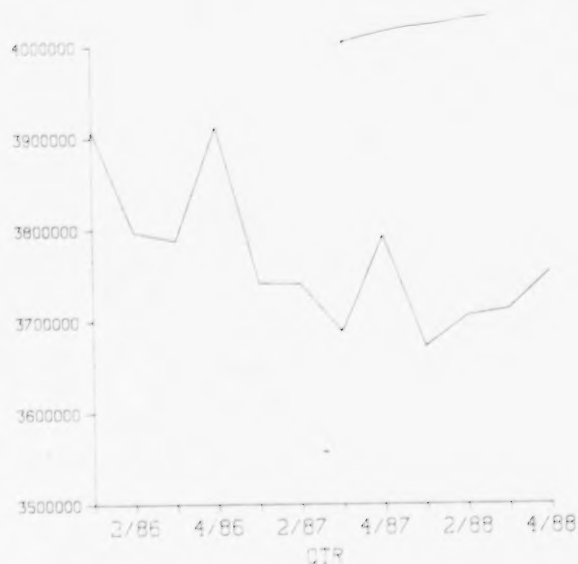
Changes in Wyoming active rig count, total bank deposits, and Wyoming gas production highlight the Update's fourth quarter statistics.

The Wyoming active rig count dropped to a low of 31 for the fourth quarter of 1988. Average daily oil production for the third quarter of 1988 was 309,000 thousand barrels per day, up slightly from the first and second quarters 1988 but down from the fourth quarter 1987.

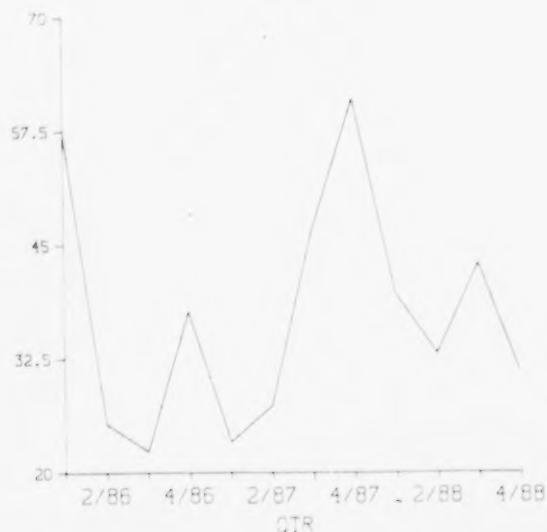
Total deposits in State and National Banks in Wyoming continued to increase slowly since the beginning of 1988. Total deposits were up from \$3,671,572 thousands in the first quarter to \$3,753,325 thousands in fourth quarter of 1988.

The total Wyoming natural gas production dropped slightly from 1430 million cubic feet per day in the first quarter to 1334 million cubic feet per day in the second quarter of 1988. This drop follows a pattern established by Wyoming gas production over the past 20 quarters.

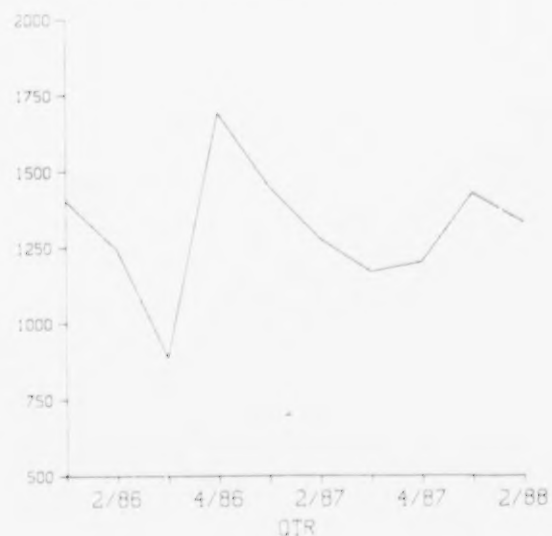
Total Bank Deposits



Wyoming Active Rig Count



Wyoming Gas Production



**WYOMING
DATA**

Table 7: Agriculture¹

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. Timber Cut in Wyoming National Forests (MBF)	27236.	10067.	10867.	42510.	47783.	25572.	20299.	75482.	28080.	5860.	39416.	54863.
Price Indices ² (1967=100)												
2. Wyoming Crops, Prices Received-Latest	241.	222.	216.	208.	204.	209.	229.	218.	209.	236.	319.	310.
3. Wyoming Crops, Prices Received-Average	245.	232.	219.	215.	206.	207.	230.	218.	208.	221.	303.	312.
4. U.S. Crops, Prices Received-Latest	214.	209.	187.	190.	192.	210.	266.	216.	211.	249.	265.	261.
5. U.S. Crops, Prices Received-Average	214.	216.	195.	191.	192.	203.	223.	217.	214.	228.	263.	259.
6. Wyoming, All Commodities, Prices Received-Latest	236.	224.	248.	235.	261.	263.	304.	268.	296.	275.	301.	294.
7. Wyoming, All Commodities, Prices Received-Average	237.	233.	241.	241.	260.	268.	283.	273.	287.	288.	283.	304.
8. U.S. All Commodities, Prices Received-Latest	223.	222.	223.	220.	222.	237.	235.	232.	237.	253.	265.	265.
9. U.S., All Commodities, Prices Received-Average	224.	222.	227.	223.	222.	233.	234.	235.	238.	245.	263.	263.
10. Wyoming Livestock, Prices Received-Latest	235.	225.	257.	242.	278.	280.	327.	283.	322.	287.	295.	289.
11. Wyoming Livestock, Prices Received-Average	235.	233.	247.	248.	276.	286.	300.	289.	310.	308.	277.	301.
12. U.S. Livestock, Prices Received-Latest	231.	234.	256.	247.	249.	261.	201.	248.	260.	258.	267.	269.
13. U.S. Livestock, Prices Received-Average	233.	229.	255.	251.	250.	242.	241.	252.	260.	261.	264.	267.
14. Prices Paid by U.S. Farmers-Average	324.	326. ³	324.	321.	327.	331.	336.	335.	339.	348.	352.	354.

¹First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.

²The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

³This figure is for the month of April. This index is now reported in the months of January, April, July, and October.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics

Table 8: Banking and Finance

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. Total Bank Loans and Leases Financing Receivables (T\$)	2173437.	2108551.	2066324.	2003375.	1932753.	1931400.	1779168.	1765203.	1733754.	1787542.	1777474.	1758410.
2. Total Bank Deposits (T\$)	3908134.	3797038.	3787785.	3912276.	3741328.	3740737.	3688191.	3792473.	3671572.	3705311.	3712403.	3753325.
3. Total Non-Interest-Bearing Deposits (T\$)	624421.	620064.	611410.	638317.	559803.	591011.	582741.	603809.	531243.	564608.	572367.	577610.
4. Savings and Loan Mortgage Loans (T\$) ¹	826697.	817750.	811230.	787910.	810354.	812614.	794162.	772721.	744492.	740954.	726300.	INA
5. Savings and Loan Deposits (T\$)	1139851.	1137374.	1137155.	1148406.	1120110.	1104107.	1104332.	1137196.	1119558.	1107268.	1107961.	INA
6. Prime Interest Rate ²	9.10	8.50	7.50	7.50	7.50	8.25	8.70	8.75	8.50	9.00	10.00	10.5

¹Only members of the Federal Home Loan Bank Board are included. Indicates amount at the end of the quarter.

²Prime rate charged by banks on short-term business loans. Rate is for last month of the quarter.

Sources: Series 1-3: Office of the State Examiner of Wyoming. Abstract Report of State and National Banks in Wyoming. Published Quarterly.
 Series 4 and 5: Federal Home Loan Bank of Seattle. Monthly Report. Comparative statistical analysis of member institutions.
 Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 9: Business Conditions

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. New Domestic Corporations	308.	301.	262.	307.	256.	270.	267.	254.	300.	298.	246.	221.
2. New Foreign Corporations	251.	223.	189.	217.	206.	232.	259.	229.	208.	196.	208.	232.
3. Total New Corporations	559.	524.	451.	524.	462.	502.	526.	483.	508.	494.	454.	453.
4. Business Failures	74.	83.	89.	64.	47.	72.	56.	53.	75.	52.	34.	32.
5. Value of Business Failures (\$)	-933393 ¹	-2898465.	7242872.	12405831.	2935220.	5896578.	5918282.	14181020.	11499022.	3906790.	28339514.	36551338.
6. Personal Bankruptcies	238.	321.	288.	340.	333.	359.	301.	308.	271.	351.	306.	306.

¹ Assets exceed liabilities.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.

Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 10: Construction

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. New Residential Dwelling Units	287.	544.	494.	317.	270.	458.	744.	297.	317.	449.	339.	292.
2. Value of Residential Dwellings Constructed (M\$)	19.5	33.4	33.0	21.6	17.6	34.2	59.4	34.3	24.4	37.3	28.8	22.9
3. Value of Nonresidential Construction (M\$)	14.2	38.7	51.3	9.2	6.8	39.7	23.0	18.2	2.8	35.2	7.0	10.2
4. Building Permits Issued in Selected Wyoming Cities	2547.	3979.	3698.	2112.	1015.	2841.	3953.	2451.	1489.	2763.	2220.	2082.
5. Value of Authorized Construction (T\$)	21484.	49454.	38669.	20453.	9083.	23444.	24258.	13633.	15559.	25330.	21878.	18071.
6. Mortgage Interest Rate ¹	10.01	9.74	9.74	9.43	8.77	9.05	9.03	8.78	8.77	8.72	8.90	9.03

¹Conventional first mortgage for new home purchase. U. S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Local Construction Potentials." Published monthly.
 Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.
 Series 6: U. S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 11: Consumers

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. New Truck Registrations	3343.	3650.	3951.	2993.	2253.	3155.	3011.	3391.	2867.	3508.	3203.	3227.
2. New Car Registrations	3200.	3804.	4181.	2784.	2211.	3171.	3332.	3027.	2736.	3147.	2969.	2849.
3. Wyoming Personal Income (M\$)	6838.	6599.	6265.	6116.	6103.	6288.	6240.	6292.	6281.	6585.	6510.	INA
4. U.S. Disposable Income (B\$)	2935.	3010.	3038.	3062.	3126.	3147.	3225.	3316.	3376.	3421.	3507.	3568.
5. U.S. Personal Income (M\$)	3451458.	3507381.	3537172.	3589561.	3663685.	3721716.	3785589.	3901510.	3923680.	4003548.	4074838.	INA
6. Latest U.S. Consumer Price Index (1982-1984=100) ¹	321.4	323.0	324.9	325.7	111.0 ²	112.4	113.8	114.2	115.1	116.7	118.5	119.2
7. Quarter's Average U.S. CPI	323.0	321.6	327.1	325.4	110.5 ²	112.0	113.3	114.2	114.8	116.7	117.8	119.5
8. Liquor Sales (T\$)	6293.	7500.	8334.	8811.	5421.	6673.	7616.	8379.	5679.	6714.	7041.	8368.

¹Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers.

²Beginning January 1987, the consumer price index, previously expressed on a base of 1967=100, has been rebased to 1982-84=100. Selection of the 1982-84 period was made to coincide with the updated expenditure weights, which are based upon data tabulated from the Consumer Expenditure Surveys for 1982, 1983, and 1984. Historical data on the new base or additional information regarding these changes is available from the Bureau of Labor Statistics, Washington, D.C. 20212.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
 Series 3,4: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published quarterly.
 Series 4,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
 Series 8: Wyoming Liquor Commission. Sales data are reported to IPR.

Table 12: Employment and Labor¹

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. Civilian Labor Force	243710.	253139.	255514.	243637.	238819.	248444.	242054.	230684.	227571.	233949.	235003.	232159.
2. Employment	220575.	230952.	235065.	221405.	209316.	226738.	225635.	214312.	208257.	220780.	223829.	216417.
3. Unemployment	23135.	22187.	20449.	22233.	29503.	21707.	16419.	16371.	19315.	13168.	11174.	15741.
4. Unemployment Rate	9.5	8.8	8.0	9.1	12.4	8.7	6.8	7.1	8.5	5.6	4.8	6.8
5. Initial Claims Filed	15095.	13146.	11710.	14560.	13392.	8086.	6386.	9983.	10949.	6888.	5376.	9709.
6. Applications Received	14321.	14968.	13057.	10542.	10013.	11276.	9067.	9470.	INA	INA	INA	INA
7. New Non-Agricultural Openings	7059.	10595.	10997.	7408.	4872.	9515.	9532.	8342.	INA	INA	INA	INA
8. New Non-Agricultural Placements	6348.	8490.	8869.	7149.	4182.	8020.	7117.	8061.	INA	INA	INA	INA
9. Miners' Average Weekly Hours	44.2	42.0	42.0	42.7	40.9	40.8	42.7	45.4	42.2	44.1	43.7	43.1
10. Miners' Average Weekly Pay (\$)	610.74	609.92	609.39	627.13	599.03	602.91	605.87	637.42	625.04	649.91	640.19	650.14
11. Miners' Average Hourly Wage (\$)	13.83	14.53	14.51	14.68	14.66	14.79	14.19	14.04	14.80	14.75	14.65	15.07

¹ The most recent year's data are preliminary.

Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published monthly.

Table 13: Energy and Mineral Production

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. Wyoming Coal (TST)	34323.	30093.	34406.	36350.	35184.	33887.	39261.	38831.	40228.	40802.	41355.	42257.
2. U.S. Coal (TST)	226592.	222359.	215298.	222291.	222892.	219022.	226784.	246314.	237128.	230464.	241952.	258662.
3. Wyoming Oil (TBPB)	340.	330.	327.	317.	310.	302.	310.	317.	300.	302.	309.	310.
4. U.S. Oil (TBPB)	9052.	8815.	8505.	8390.	8371.	8339.	8227.	8347.	8329.	8301.	8185.	8073.
5. Wyoming Natural Gas (MMCFD) ¹	1404.	1243.	888.	1692.	1453.	1281.	1171.	1203.	1430.	1334.	INA	INA
6. U.S. Natural Gas (MMCFD)	48251.	44326.	43457.	46953.	50801.	45830.	44335.	49241.	50768.	46453.	44547.	INA
7. Active Rig Counts in Wyoming-Average	57.	25.	22.	38.	23.	27.	47.	61.	40.	33.	43.	31.

¹Beginning with fourth quarter 1986, Wyoming gas includes carbon dioxide production.

Sources: Series 1,2,5, and 6: U. S. Department of Energy. Energy Data Reports. Gas data are from Natural Gas Monthly, and the Wyoming Oil & Gas Conservation Commission. Coal data are published weekly.

Series 3-4: The Oil and Gas Journal, U.S. and Wyoming Oil Production. Published weekly.

Series 7: Petroleum Information Corporation, Hughes Tool Company. Monthly Average Active Rig Counts in Wyoming.

Table 14: Government

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. Sales and Use Tax Collections (T\$)	53816.	47695.	55716.	51058.	39867.	39591.	44922.	47115.	42585.	42769.	49721.	46445.
2. Violent Crime ¹	292.	380.	374.	269.	299.	325.	435.	354.	354.	371.	431.	308.
3. Nonviolent Crime ²	4294.	5485.	5265.	4294.	3955.	4772.	5057.	4420.	3713.	4562.	4662.	3917.
4. Stolen Property (T\$)	2529.	3713.	2420.	2222.	1880.	2342.	2494.	2199.	1770.	1986.	2467.	2272.
5. Stolen Property Recovery Rate	34.2	54.0	38.6	31.0	41.4	35.7	33.1	34.1	42.2	43.1	35.5	36.0
6. Percent of Crimes Cleared ³	28.2	24.7	25.2	36.4	32.0	26.6	44.2	34.5	33.7	28.3	30.9	40.0

¹Murder, negligent homicide, forcible rape, robbery, aggravated assault.

²Burglary, larceny, auto theft.

³Clearance of a crime indicates resolution of a complaint by arrest or other extraordinary means.

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and Use Tax Division. "Net Collections by Business Class by County." Published monthly.

Series 2-6: Uniform Crime Reporting Center for Criminal Justice Research, Division of Criminal Identification, Office of the State Attorney General. "Crime in Wyoming." Published quarterly.

Table 15: Tourism

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
<u>Visitors, National Parks and Monuments</u>												
1. Yellowstone	79077.	607923.	1593749.	124314.	75835.	681163.	1692818.	168613.	83736.	649842.	1268270.	216076.
2. Grand Teton	138794.	530991.	1314373.	196051.	141570.	535659.	1486479.	264932.	144982.	624400.	1083754.	223562.
3. Devil's Tower	9237.	86167.	186134.	16610.	8523.	92700.	215299.	17980.	7121.	109993.	222877.	20702.
4. Fossil Butte	205.	4367.	10105.	1152.	282.	5082.	13793.	1072.	286.	5894.	13838.	1195.
5. Fort Laramie	2027.	28120.	52465.	3863.	1305.	35117.	50167.	4437.	1172.	24384.	49631.	4145.
6. Big Horn NRA-South ¹	18574.	53634.	65696.	40878.	22056.	55064.	70305.	40782.	30045.	60727.	58820.	35558.
<u>Other Tourism Indicators</u>												
7. Traffic Count (Avg. number of Vehicles/Day)	90397.	119613.	147829.	91685.	78349.	116920.	163546.	113385.	88529.	142830.	178675.	118023.
8. Hotel, Motel, and Camp Sales Tax (T\$)	852.	1185.	2205.	1364.	928.	891.	1821.	1871.	947.	1050.	2106.	1929.
9. Gasoline Sales (TGL)	62891.	76603.	95902.	68488.	56561.	79620.	98146.	71190.	62295.	81811.	96106.	19A

¹ Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
 Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
 Series 8: Wyoming Department of Revenue and Taxation. "Sales and Use Tax Summary by County by SIC Major and Minor." Reported monthly.
 Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 16: Utilities¹

Calendar Quarters	1/86	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88
1. Residential Electric Connections	179931.	179179.	177718.	177613.	177091.	176113.	175745.	175879.	175896.	176333.	177122.	176457.
2. Residential Electric Consumption (TKWH)	502703.	342033.	300186.	408558.	476965.	337943.	291941.	399068.	505669.	351036.	301098.	401776.
3. Commercial Electric Connections	33606.	33885.	33786.	33880.	33355.	33744.	33898.	33780.	33602.	33722.	33846.	33756.
4. Commercial Electric Consumption (TKWH)	499198.	425035.	418211.	486495.	438712.	403123.	419465.	416675.	456190.	420630.	425495.	426766.
5. Industrial Electric Connections	2927.	2811.	2884.	2655.	2989.	2791.	2796.	2764.	2760.	2748.	2921.	2872.
6. Industrial Electric Consumption (TKWH)	1514740.	1313271.	1452583.	1708946.	1718924.	1587866.	1740306.	1819191.	1788103.	1815370.	1720051.	1847617.
7. Other Connections ²	3451.	3285.	3317.	3030.	2801.	3201.	3195.	2680.	2965.	3690.	3899.	3404.
8. Other Consumption (TKWH)	11110.	41061.	66445.	55088.	47998.	51328.	84447.	16355.	10451.	24283.	64994.	13221.
9. Residential Natural Gas Connections	76146.	75383.	74548.	75188.	75206.	74384.	73512.	72654.	74286.	73935.	90673. ³	93300.
10. Residential Natural Gas Consumption (MCF)	3860776.	1833160.	1013300.	2661644.	3840399.	1944656.	740699.	2274494.	4310738.	2042533.	826220. ³	2521850.
11. Commercial Natural Gas Connections	10926.	6651.	6545.	6623.	6652.	6617.	6546.	6520.	6643.	6560.	8357. ³	9398.
12. Commercial Natural Gas Consumption (MCF)	1890077.	1760704.	398174.	1125927.	1687452.	939284.	408459.	997247.	1939461.	957241.	475106. ³	1349515.
13. Industrial Natural Gas Connections	91.	91.	91.	95.	98.	93.	88.	87.	88.	90.	90.	78.
14. Industrial Natural Gas Consumption (MCF)	2914089.	1885998.	1309870.	1770920.	1129556.	601308.	508551.	828532.	3249154.	482088.	2324709.	2504087.
15. Other Natural Gas Connections	42.	40.	38.	37.	37.	37.	38.	101.	39.	36.	35.	34.
16. Other Natural Gas Consumption (MCF)	216.	1136.	5478.	132.	170.	1225.	7352.	6988.	12922.	1920.	7488.	232.

¹ Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

² "Other" includes agriculture, municipal, and other public.

³ Starting with third quarter, 1988, the figures for Residential and Commercial Natural Gas Connections and Residential and Commercial Natural Gas Consumption reflect the merger of Northern Gas Division, Northern Utilities Division, and Northern Mountain Gas Company now doing business as Northern Gas of Wyoming.

Sources: Series 1-16: Reports to IPR by selected electric and natural gas utility companies. Survey conducted monthly.

Average Rents by City, Fourth Quarter 1988 vs. Fourth Quarter 1987

City	Apartment ¹			Trailer Lot ²			House ³			Mobile Home ³		
	4Q88	4Q87	% CHG. 88 vs. 87	4Q88	4Q87	% CHG. 88 vs. 87	4Q88	4Q87	% CHG. 88 vs. 87	4Q88	4Q87	% CHG. 88 vs. 87
Cheyenne	\$319.15	\$340.12	-6.17%	\$126.60	\$134.00	-5.52%	\$415.39	\$436.03	-4.73%	\$284.53	\$265.50	7.17%
Casper	237.49	246.17	-3.53%	113.71	130.00	-12.53%	329.66	325.91	1.15%	224.69	221.33	1.52%
Cody	249.69	282.69	-11.67%	130.00	130.00	0.00%	336.67	341.36	-1.37%	280.71	256.79	9.32%
Douglas	246.37	263.75	-6.59%	113.33	113.33	0.00%	358.85	332.75	7.84%	241.67	216.67	11.54%
Evanston	228.69	279.24	-18.10%	147.80	142.00	4.08%	348.54	369.14	-5.58%	283.33	291.43	-2.78%
Gillette	260.47	276.75	-5.88%	170.00	175.00	-2.86%	388.55	422.62	-8.06%	292.00	313.21	-6.77%
Jackson	406.67	366.43	10.98%	140.00	128.33	9.09%	456.67	431.39	5.86%	349.00	372.00	-6.18%
Kemmerer	232.22	240.00	-3.24%	131.67	130.00	1.28%	241.67	392.81	-38.48%	279.55	295.75	-5.48%
Laramie	305.21	332.80	-8.29%	129.00	130.60	-1.23%	378.25	378.67	-0.11%	258.67	281.25	-8.03%
Newcastle	194.00	303.00	-35.97%	82.50	82.50	0.00%	246.43	297.27	-17.10%	213.64	298.18	-28.35%
Rawlins	226.58	236.60	-4.23%	122.50	122.50	0.00%	334.74	299.50	11.77%	246.88	265.00	-6.84%
Riverton	250.50	250.24	0.10%	103.75	98.75	5.06%	264.83	282.22	-6.16%	207.50	238.81	-13.11%
Rock Springs	249.17	316.25	-21.21%	166.63	164.13	1.52%	395.43	394.09	0.34%	312.14	304.11	2.64%
Sheridan	244.44	272.89	-10.43%	130.00	136.67	-4.88%	320.56	294.74	8.76%	238.89	271.88	-12.13%
Worland	220.00	257.50	-14.56%	115.00	110.00	4.55%	252.50	321.67	-21.50%	218.67	246.92	-11.44%
Statewide	\$258.04	\$284.30	-9.23%	\$128.17	\$128.52	-0.28%	\$337.92	\$354.68	-4.73%	\$262.12	\$275.92	-5.00%

¹ -2 bedroom, unfurnished, excluding gas and electric

² -single wide, including water

³ -2 or 3 bedroom, single family, excluding gas and electric

Source: Wyoming Department of Administration and Fiscal Control, Research and Statistics Division.

Wyoming Comparative Cost of Living Index (January 4, 5, and 6, 1989): Statewide Average = 100¹

City	Rank	All Items	Food	Housing	Apparel	Transportation	Medical	Recreation ²
Jackson	1	116.1	100.3	132.9	107.9	105.0	96.7	109.2
Cheyenne	2	103.5	100.1	110.5	101.6	95.2	100.8	98.2
Gillette	3	103.3	99.2	108.9	85.6	102.1	104.9	99.8
Rock Springs	4	103.3	94.3	109.0	105.8	100.9	92.0	103.0
Laramie	5	102.0	101.4	104.5	106.5	98.9	99.2	97.4
Evanston	6	100.9	96.3	101.1	96.5	104.5	107.2	100.6
Sheridan	7	100.2	106.3	96.3	108.1	98.8	106.5	100.1
Douglas	8	99.6	105.4	95.8	110.1	100.5	98.7	98.9
Rawlins	9	98.2	102.4	97.5	90.3	99.3	99.1	97.5
Casper	10	98.2	99.4	93.2	102.8	104.8	103.4	98.8
Cody	11	98.1	105.2	96.1	101.6	96.4	89.2	100.0
Kemmerer	12	95.9	95.1	93.8	97.1	98.7	102.1	96.2
Riverton	13	94.5	95.8	88.3	94.5	101.1	101.9	101.0
Worland	14	93.3	94.7	88.8	89.9	97.8	98.9	99.1
Newcastle	15	93.1	104.0	83.3	101.7	96.1	99.3	100.3

¹Previously, this study was conducted quarterly. However, beginning with second quarter 1988, the survey will be conducted twice yearly.

²Recreation and Personal Care.

This report is based upon 140 items priced in fifteen selected communities throughout Wyoming during January 4, 5, and 6, 1989. Prior to the third quarter 1987, twenty-four Wyoming communities were involved in the Wyoming Cost of Living Index. This program reduction was due primarily to budgetary limitations, as well as problems in data retrieval in the smaller communities. The surveyed items are aggregated into six categories which are weighted according to their importance in the consumer's budget. These categories and respective weight components of the total are: Food (16.246%), Housing (42.036%), Apparel (6.335%), Transportation (17.217%), Medical (5.420%), and Recreation and Personal Care (12.746%). The Housing category, due to its importance in the consumer's budget, carries the largest weighting factor and is most influential in the WCLI.

The WCLI compares each community's price level, as of the second quarter, to the statewide average. Movement of a particular community in ranking from a previous quarter does not mean that it has become less or more expensive to live there. Instead, it reflects the situation at the time of data collection, per locality, relative to the statewide average.

Source: Wyoming Department of Administration and Fiscal Control, Research and Statistics Division.

FORMAT

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 1st quarter of 1986, and end with the 4th quarter of 1988. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Quarters are calendar quarters. For example, the 4th quarter is composed of October, November and December. In the table headings and narratives, a particular quarter will be indicated by notation such as 3/86 (3rd quarter, 1986), 4/86 (4th quarter, 1986), and so on.

Beside each data series name is an abbreviation in parenthesis. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the State unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronym "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from IPR. A list of sources follows the footnotes.

Key to Units Abbreviations

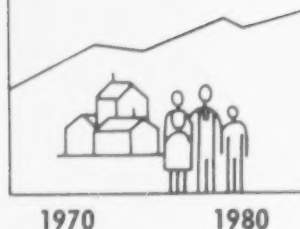
MBF - Thousand Board feet	CWT - Hundred Weight
KWH - Kilowatt Hours	ST - Short Tons
TKWH - Thousand Kilowatt Hours	HST - Hundreds of Short Tons
\$ - Dollars	TST - Thousands of Short Tons
H\$ - Hundreds of Dollars	\$/ST - Dollars Per Short Ton
T\$ - Thousands of Dollars	HBBL - Hundreds of Barrels
M\$ - Millions of Dollars	TBPD - Thousands of Barrels Per Day
B\$ - Billions of Dollars	MCF - Thousands of Cubic Feet
GL - Gallons	HMCF - Hundreds of MCF Per Day
TGL - Thousands of Gallons	MMCFD - Million Cubic Feet Per Day

CRIS

Census Retrieval Information Service

P.O. Box 3925
Laramie, WY 82071
(307) 766-5141

Room 302
Emerson Building
Cheyenne, WY 82002
(307) 777-7504



U. S. Census information for Wyoming is handled by the Census Retrieval Information Service (CRIS). CRIS serves as the U. S. Bureau of the Census State Data Center and responds to specific information requests. Data from the 1980 Census of Population and Housing is available as well as more current information on population, housing, agriculture, construction, government, and economic topics.

In a recent news release the Census Bureau announced that they and the Office of Management and Budget have agreed on the number of households to be sampled in the 1990 census and on which questions to ask on the census forms. Under the agreement, some 17.7 million housing units will receive a long form in 1990 out of an estimated total of 106 million units. The questions are designed to produce quality statistics for all segments of the population including the elderly, low income workers, Blacks, Hispanics, those of Asian and Pacific Island descent, American Indians, and Alaska Natives.

SUBJECTS PLANNED FOR THE 1990 CENSUS OF POPULATION AND HOUSING

100-Percent Component

<u>Population</u>		<u>Housing</u>	
Name	Age	Number of units in structure	Tenure
Household relationship	Marital Status	Number of rooms in unit	Congregate Housing
Sex	Hispanic Origin	Vacancy Characteristics	Value of Owned
Race			Unit or Rent Paid

Sample Component

<u>Population</u>	<u>Population</u>	<u>Housing</u>
Social characteristics:	Economic characteristics:	Source of water and method of sewage disposal
Education--enrollment and attainment	Employment and unemployment	Autos, light trucks, and vans
Place of birth, citizenship, and year of entry	Occupation, industry, and class of worker	Kitchen facilities
Ancestry	Place of work and commuting to work	Year structure built
Language spoken at home	Work experience and income in 1989	Year moved into residence
Migration		Number of bedrooms
Disability		Farm residence
Fertility		Shelter costs, including utilities
Veteran status		Condominium status
		Plumbing
		Telephone
		Utilities and fuels

Note: Subjects covered in the 100-percent component will apply to all persons and housing units. Those covered by the sample component will apply to a portion of the population and housing units.

CRIS is a cooperative service provided by the Institute for Policy Research, University of Wyoming, and the Research and Statistics Division, Wyoming Department of Administration and Fiscal Control.

We look forward to assisting you in the future.

G. Fred Doll
Institute for Policy Research
University of Wyoming

Mary Byrnes
Research and Statistics Division
Department of Administration and
Fiscal Control

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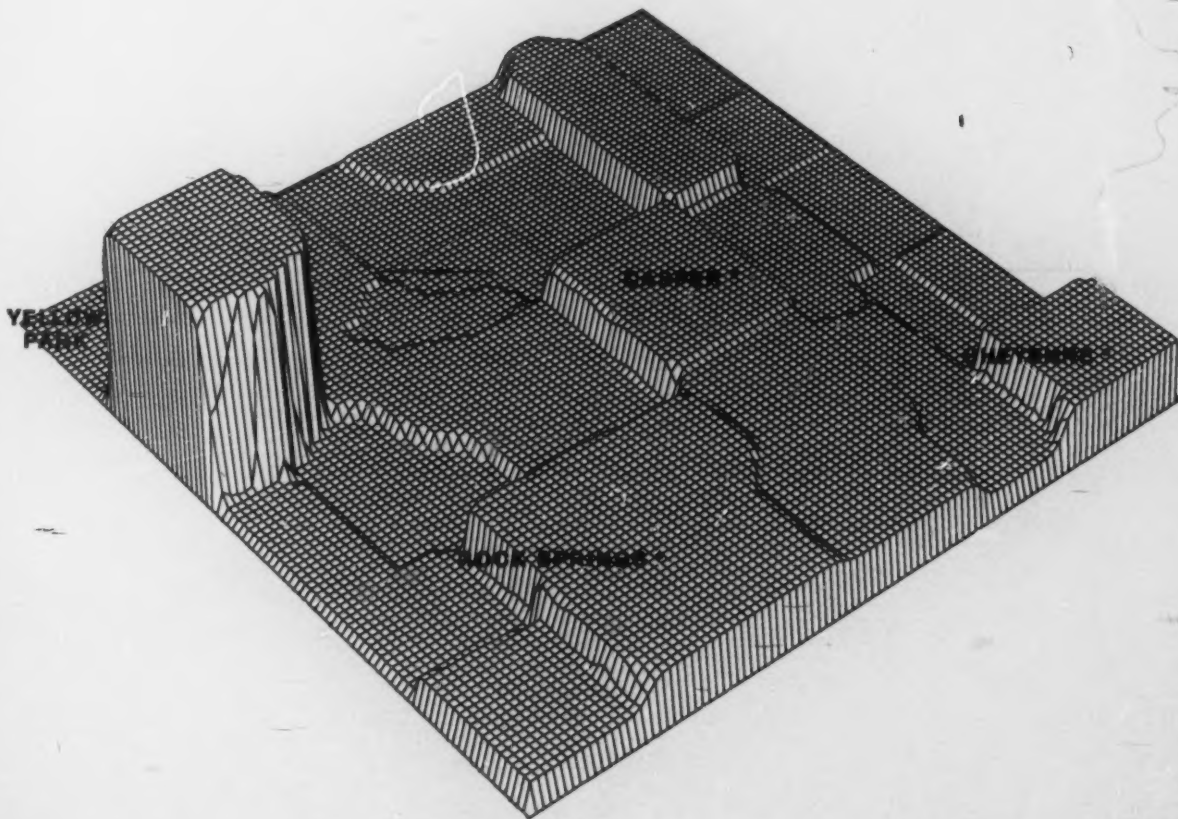
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WYOMING QUARTERLY UPDATE

SPRING 1989

Vol. 8, No.3



Total Lodging County Sales Tax for the First Quarter of 1989

INSTITUTE FOR POLICY RESEARCH
OFFICE OF RESEARCH AND GRADUATE STUDIES
UNIVERSITY OF WYOMING

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Institute for Policy Research (IPR) at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of IPR greatly appreciates the ongoing, helpful cooperation of each of the data sources listed in the bibliography.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by IPR. Readers are encouraged to contact IPR to find out how to gain access to data which do not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a graph showing the total lodging county sales tax collected by each county in the first quarter of 1989. Of the total tax collected, 99 percent is returned to the county. Counties with more travelers stopping in the county benefit the most from this tax. Note the counties along I-80 and around Yellowstone Park. The data used for the graph are listed below.

County	Dollars(\$)	County	Dollars(\$)	County	Dollars(\$)
Albany	34643	Hot Springs	15292	Sheridan	15060
Big Horn	3891	Johnson	3469	Sublette	1750
Campbell	60247	Laramie	102696	Sweetwater	91547
Carbon	75910	Lincoln	11278	Teton	324306
Converse	22578	Natrona	81560	Uinta	44848
Crook	3557	Niobrara	2746	Washakie	5578
Fremont	24790	Park	25597	Weston	7843
Goshen	10573	Platte	2245		

First-time readers of WQU should refer to the "format" explanations on page 46 for keys on how best to use and interpret data presented in this publication.

For additional information, contact:

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The articles appearing in this publication represent the opinions of the authors and do not necessarily reflect the views of the State of Wyoming or the University of Wyoming or their respective executive officers. Duplication or quotation of material in this publication is welcomed, but it is requested that WQU, the Institute for Policy Research, University of Wyoming, be credited.

**WYOMING
SCENE**

Overview and Perspective

Throughout the past year, the Federal Reserve Board has attempted to restrain the economy just enough to prevent inflation from spiraling out of control, but not so much as to end the longest peacetime expansion in U.S. history, now in the middle of its seventh year. The Business Council, composed of 65 executives from America's largest corporations, forecast at their semiannual meeting in May a sharp slowdown in economic growth and little progress on taming inflation. It is expected that policymakers will suspend their campaign to cure inflation with higher interest rates as they wait to see whether recent signs of an economic slowdown persist.

In April, retail sales rose a less-than-expected 0.4 percent, the unemployment rate crept up to 5.3 percent, and industrial production rebounded only moderately from two weak months. Wholesale prices climbed a modest 0.4 percent in April despite a steep rise in gasoline costs. Energy prices soared 7.2 percent - in particular, gasoline prices rose as much as 25 percent in one month. Those rises were largely offset, however, by a broad fall in food prices and by a substantial decline in auto costs.

The U.S. industrial operating rate rose moderately to 83.9 percent in April. The capacity rate had reached a ten-year high of 84.3 percent in December. The rate held steady in January and slipped in both February and March. A year ago the rate was 82.7 percent. As the rate nears full capacity, there is a clear acceleration in inflation as factories find it difficult to produce enough to meet demand. The sluggish growth indicated by the April rate supports the anticipated economic slowdown.

Construction is genuinely weak, reflecting the impact of higher interest rates on home-building. Construction outlays, down 0.3 percent in March, lost ground for the third consecutive month.

The National Association of Purchasing Management's index of business activity--a composite reading of orders, production, employment, inventories, delivery speed, and prices for industrial companies--fell sharply

last quarter. But it rebounded in April to 53 percent, suggesting that industry is improving its condition.

Another drought is threatening about 40 percent of the Farm Belt, although it is not expected to approach last year's devastation. Economists and agricultural processors alike are watching U.S. weather conditions especially close. Ohio and Indiana are among the big farm states which have already had abundant rainfall.

Withdrawals from savings and loans outpaced new deposits by \$8.5 billion in March, indicating that thrifts are still losing funds to competitors such as money markets. Outflows focused on 20 thrifts - mostly in the southwest and the west.

Crude oil prices climbed more than 30 percent in the first four months of 1989. Although the rise is expected to push consumer prices up, it will have welcome effects in oil producing states like Texas and Wyoming.

Wyoming's economy has been relatively stable in the past year, indicating the state economy may have bottomed out.

Several 1988 statistics were just released:

1. A report published in May showed that Wyoming in 1988 became, for the first time, the top coal-producing state in the country, surpassing long-time leader Kentucky. With a 1988 production total of 163.6 million tons, Wyoming experienced a healthy coal production increase of 12 percent over 1987.

2. The Wyoming Coincident Indicator Index, an index of four economic variables that reflect the state's overall economic health, increased by 0.2 percent in the last quarter of 1988 from the last quarter of 1987. The increase came despite a strong negative showing in the industrial index which consists of the number of active oil rigs in the state, the price index for all agricultural commodities and the volume of fuel sales. However, the 8.4 percent loss in the industrial index and a 5.3 percent decline in tax collections were offset by a 1.7 percent increase in employment and a 5.3 percent increase in wages.

3. The preliminary Dun & Bradstreet Business Failure Record for 1988 showed that 205 Wyoming businesses failed in 1988, compared to

272 in 1987, a decline of about 25.2 percent. Nationally, the number of business failures dropped by 6.6 percent, while the Rocky Mountain Region reported a 2.7 percent decline in the number of failures. The area of services saw the greatest number of failures in 1988, with 94 companies closing their doors, compared to 117 service business failures in 1987. In mining, meanwhile, three companies failed in 1988, compared to eight in 1987. The report covers only failed businesses, not companies that close for reasons such as retirement, ill health, inadequate profits or loss of capital.

During the first week of May, the number of oil rigs on their way to drilling sites or at work in Wyoming increased by six, for a total of 32 rigs in the state. This reflects the number of rigs actively exploring for oil, not necessarily producing. Wyoming's rig count tumbled to 27 in the second week of May and remained far below the 41 drilling rigs on the job a year ago, although it is above the March 1989 level of 20 working rigs. Nationally the rig count had climbed for the second straight week.

Wyoming's labor force continued to decline in March, dropping by more than 3,800 throughout the year. The March unemployment rate was reported at 7.1 percent, a meager decline of 0.3 percent from the rate of 7.4 percent reported last year. The state's seasonally adjusted unemployment rate in March stood at 5.9 percent, a decline from the March 1988 rate of 6.1 percent. The figure is almost 1 percent higher than the national average seasonally adjusted unemployment rate of 5 percent. Lincoln County had the state's highest unemployment rate in March at 10.5 percent, followed by Uinta and Fremont counties with rates of 9.6 percent. Teton County's unemployment rate of 2.9 percent was the lowest in the state, followed by Albany County with a rate of 4 percent. Seven Wyoming counties, Big Horn, Fremont, Park, Platte, Sheridan, Teton and Weston, recorded annual increases in their workforces.

Concerns about the economic effect of last year's Yellowstone fires may be temporarily eased due to a combination of increased promotions and visitor curiosity. Early tourist visitation in Yellowstone National Park is

running well ahead of last year's pace. Park officials reported a 12 percent increase in visitors in early May compared to the same time last year. Jackson County's unemployment rate dropped to 2.9 percent in March, compared to 3.6 percent in March 1988. Airline traffic into Jackson Airport increased by 10 percent compared to last year at the same time.

In the agriculture sector, despite a projected water shortage in the Greybull River Valley, the number of sugar beet contracts in the Western Sugar district increased by 35 percent from last year.

While the sale of hard liquor is down nationally, it is lower yet in Wyoming. The Liquor Commission reported a nearly \$1.3 million decline in net dollar sales for the first eight months of the fiscal year compared to the same period the previous year.

Amox Coal Company hit a production milestone this year, having produced 300 million tons of coal during its 16 years in Wyoming. Amox is the third largest coal company in the nation. In other corporate news, Tenneco Minerals announced a plan to increase soda ash production and to construct two new specialty product plants west of Green River in response to continued high demand for caustic soda and soda ash.

The Economic Development and Stabilization Board's recent promotion campaign for the state has generated 950 inquiries from businesses, and 20 of those businesses have moved forward with very serious proposals. Plans for a natural gas pipeline between Wyoming and California are moving forward.

If businesses capitalize on the opportunity presented, Natrona County International Airport's temporary designation as a foreign trade zone could push Wyoming-made products into markets abroad. The trade zone allows a company to manufacture goods with imported parts and pay lower custom tariffs, or defer duty fees while storing goods. The designation could provide the opening for Wyoming to tap into global trade.

As the state approaches the summer months, it is hoped that these positive trends will continue to heal the ailing economy.

Kathie Cuomo

Spring Minerals Update

OVERVIEW

The pleasant surprises mentioned at the end of the last year continued into the first quarter of 1989 and have made the writing of this update rather upbeat for a change. Oil prices, which strengthened at the end of 1988 following OPEC's agreement on new reduced production quotas, have gradually risen through the new year to where Wyoming Sweet crude was quoted at \$20.00 a barrel in early May. At least on the short-term, these higher oil prices look like they will continue. This is welcome

Also there are now some potential markets for the gas besides enhanced oil recovery operations.

Without a doubt, coal production provided as great a surprise as the sustained increases in oil prices. Our estimates for 1988 coal production increased each quarter and looked like about 155 million tons near the end of the year. Production for 1988 as reported by the Wyoming State Inspector of Mines, however, showed a record setting 163.6 million tons!

Table 1: Wyoming Mineral Production Forecast to 1992¹

Calendar Year	Oil Production ²	Methane Production ³	Carbon Dioxide Production ³	Helium Production ⁴	Coal Production ⁵	Trona Production ⁵	Mined Uranium Production ⁶	In situ Uranium Production ⁷	Sulfur Production ⁸
*1981	122.1	455.4	--	--	102.8	11.8	4.6	--	0.05
*1982	118.7	465.1	--	--	107.9	10.1	2.1	--	0.07
*1983	120.9	539.7	--	--	112.2	10.5	3.0	--	0.57
*1984	127.8	600.1	--	--	130.7	11.0	1.6	--	0.63
*1985	131.0	597.9	--	--	140.4	10.8	0.6	--	0.80
*1986	122.4	563.2	23.8	0.15	136.3	13.3	0.3	--	0.66
*1987	115.9	622.7	110.5	0.84	146.5	13.6	0.2 ⁹	0.06	1.20
1988	114.0	683.0	110.5	0.84	163.6	15.1	0.02	3.0	1.20
1989	116.0	708.4	110.5	0.84	165.0	15.3	0.02	3.0	1.20
1990	110.0	728.0	110.5	0.84	165.0	15.5	0.02	3.0	1.20
1991	103.0	748.1	110.5	0.84	167.0	15.5	0.02	3.0	1.20
1992	96.5	768.9	110.5	0.84	168.0	16.5	0.02	4.0	1.20

* Actual values for comparison

¹ Geological Survey of Wyoming, April, 1989

² millions of barrels

³ billions of cubic feet

⁴ billions of cubic feet, based on Exxon's estimate that the average helium content in the gas processed at Shute Creek is 0.5 percent

⁵ millions of tons

⁶ millions of tons of uranium ore (not yellowcake)

⁷ millions of pounds of yellowcake (U₃O₈), (unknown between 1981-1986 because it was reported only as taxable valuation; estimates for 1988-1992 are based on company information)

⁸ millions of tons, converted from gallons of sulfur produced at gas processing plants as reported to the Wyoming Oil and Gas Conservation Commission

⁹ includes previously stockpiled ore processed by the Lucky Mc mill in 1987

news to the domestic oil industry and to states like Wyoming that are heavily dependent on the production and value of oil for their revenue.

While a new Wyoming to California gas pipeline is still not a reality, its likelihood of being built remains strong. Recently several California utilities that formerly opposed a new pipeline have changed their stand on the matter.

While this increase probably did not make Wyoming production the highest in the Nation, it certainly cinched second place once again with only Kentucky producing more coal. Considering this kind of production, Dick Jones, the Head of the Coal Division, has considerably revised his forecast for future production. Those revisions are shown in the table above.

In regard to some other minerals, trona production has remained high through the first quarter; plans for a new uranium mine at Green Mountain and a new bentonite mine near Casper are continuing; and there was some encouraging activity in regard to gold properties in the State.

At this time there is no reason to suspect that the optimism of this first-quarter report will deteriorate in the second quarter of 1989.

*Gary B. Glass
State Geologist
Geological Survey of Wyoming*

OIL AND GAS UPDATE

The price of Wyoming crude oil has been increasing since the OPEC production agreement was finalized at the end of November, 1988. The average posted price for Wyoming Sweet crude oil for March was \$18.25 per barrel. This compares to an average posted price of \$12.75 per barrel in November of last year before the OPEC agreement was signed. The price of crude oil over the last four months rebounded to its highest level since Fall, 1987, because OPEC adhered to production quotas, because several non-OPEC countries agreed to small production cuts, and because the demand for products was strong. In early April, future prices were fluctuating around \$20 per barrel for May delivery and the posted price had topped \$19 per barrel. The average price Wyoming producers receive for their oil, however, is still over \$1 per barrel less than the average posted price. Adjustments for low gravity crude oil account for most of the discrepancy between the average posted price and the price that producers actually receive. Although average first purchase prices for February and March are not available, they should be between \$15 to \$16.75 per barrel.

Very preliminary production figures (Petroleum Information, 1989) show that Wyoming produced 114 million barrels of oil and 793.4 billion cubic feet of natural gas in 1988. Gas production was approximately 110.5 billion cubic feet of carbon dioxide and 682.9 billion cubic feet of combustible natural gas.

Oil production was 3 million barrels lower than predicted for 1988 because of the very low crude oil prices in the last half of 1988. Wyoming producers received an average of \$13 or less per barrel during this six-month period. Two very large oil fields in the State, Lost Soldier and Powell, produced a total of 1 million barrels less oil than expected. Powell had several wells shut-in and reservoir pressure was being increased in Lost Soldier for carbon dioxide injection. Carbon dioxide injection at Lost Soldier Field, however, began at the end of January and an Amoco spokesman predicted

substantial increases in oil production from the field by the end of 1989.

In a related item, the Legislature passed a bill which extends the existing severance tax break for enhanced oil recovery (EOR) projects. To qualify for this tax break, a company engaged in an EOR project must employ certain kinds of workers within the State or more than half its ownership or employees must live in Wyoming.

Combustible natural gas production was slightly lower than predicted due to mild winter weather in November and December. Production is still estimated at about 60 billion cubic feet higher than 1987 production (9.7 percent increase). Half of the increase in production came from Swan, Blue Forest, and Lincoln Road Fields on the Moxa arch in southwestern Wyoming. Together these three fields produced an estimated 30 billion cubic feet more than they did last year.

There are many favorable signs that natural gas production in the State could expand tremendously in the next few years. In January, the Wyoming Oil and Gas Conservation Commission granted Union Pacific Resources' application to drill 100 additional gas wells in a 100-square-mile area of the Green River Basin (T.17-20N. and R.111-113W). The ruling allows a second well for each square mile in the area. Plans call for two rigs to drill the first 40 wells. Those 40 wells will be evaluated before the last 60 wells are drilled. Union Pacific estimates that each new well will produce 3.5 billion cubic feet of gas.

Enron Oil and Gas recently announced plans to double production from Big Piney Field in southwest Wyoming. Plans are to drill as many as 200 wells in the next three to five years. Enron has letters of intent that call for transportation and sale of 50 million cubic feet of Big Piney gas per day in 1989 and 100 million cubic feet per day by 1992. Increased production should begin in the fourth quarter of 1989.

The possibility of a Wyoming to California pipeline is apparently increasing. After his return from a three-day trip to California, Governor Sullivan noted that Wyoming is in a very good competitive position for the natural gas pipeline to Kern County, California. The California Energy Commission's report on alternate interstate pipeline projects rated Wyoming's pipeline the best if it is coupled with additional pipeline capacity from Canada. The report showed a \$14.6 billion gain to California from the pipeline and a \$6.3 billion loss if California does nothing.

The WyCal proposal to build a Wyoming to California pipeline recently won approval from the Federal Energy Regulatory Commission (FERC), and was the first to do so. It is likely that two other proposals (Kern River and Mojave) will also be approved. WyCal announced an agreement with Pacific Gas and Electric (PG&E) whereby PG&E agreed to withdraw its opposition to

WyCal's pipeline proposal. WyCal will provide shippers with the option of utilizing WyCal's proposed pipeline facilities in California or of utilizing PG&E's existing pipelines within California.

In another step forward, Southern California Gas lifted its opposition to the Kern River proposal and has agreed to take delivery of some of the gas. Kern River also announced that it now has contracts and letters of intent which total nearly 400 million cubic feet per day from shippers in California. The newest letter of intent is with the city of Long Beach. This letter indicates that there is a market for Wyoming gas outside the enhanced oil recovery (EOR) market. It is estimated that a pipeline from Wyoming to California would increase Wyoming's natural gas production by 180 billion cubic feet a year.

Lease sales continue to do relatively well despite the present low drilling activity in the State. The high per-acre bid at the February U.S. Bureau of Land Management (BLM) sale was \$1.225 by BTA Oil Producers for a 360-acre lease in section 20, T.13N., R.114W. near Taylor Ranch Field. Five other tracts in the sale drew bids over \$100 per acre. Yates Petroleum submitted high bids on 36 tracts. Yates picked up 55 parcels at the December, 1988, BLM sale.

The high bid at the Wyoming Department of Public Land's January sale was \$110 per acre for a 75.54-acre tract in section 6, T.54N., R.70W. near the Camp Creek Field area. Yates submitted the high bid on 54 tracts in this sale. The March sale's high bid was \$140 per acre for a 640-acre tract covering section 16, T.34N., R.75W. about three miles north of Muddy and Dakota Sandstone production in Glenrock Field. Yates Petroleum was once again the most successful bidder at this sale and picked up 45 tracts.

Wyoming and Exxon Corporation have reached a settlement in a lawsuit over the taxation of natural gas processed at Exxon's LaBarge Plant. Exxon paid the State \$5.6 million and Sublette County \$6.4 million in back taxes. The settlement also establishes a plan for valuing Exxon's natural gas for the next three years, which will result in severance and ad valorem taxes of around \$5 million per year. Helium sales will also be included in Exxon's revenue base.

In a somewhat related item, the U.S. Environmental Protection Agency (EPA) expressed concern over the carbon dioxide (CO₂) emissions at Exxon's LaBarge Plant. The plant generally emits 100 to 150 million cubic feet of CO₂ per day which the EPA claims is equivalent to emissions from a city the size of Casper. The EPA also is concerned that the proposed Amoco CO₂ processing plant would add to the emissions if it is built. Although CO₂ emissions are not currently regulated by the Federal government, an EPA spokesman said that he expects they will be in the future.

The U.S. Department of the Interior lowered the rent most companies pay to use Federal lands. It will charge \$1 per acre for many onshore oil and gas leases issued before 1987, instead of the \$2 to \$3 it had been charging. Leases issued after 1987 have a statutory rental rate of \$1.50 per acre for five years and \$2 per acre thereafter.

The State of Wyoming and the Joint Business Council of the Shoshone and Northern Arapaho Tribes announced a one year agreement for the collection of most taxes on oil and gas produced on the Wind River Reservation. The State will collect 1.5 percent in severance tax on reservation oil and gas production instead of the six percent rate that had been in effect. The reduction will permit the tribes to collect an extra \$2 million in 1989 without increasing the total tax burden on companies producing oil and gas on the reservation.

In a related item, the tribes received around \$1 million from British Petroleum for the right to explore for oil and gas near the Burris-Dinwoody area. Drilling should begin in May and the company will drill between eight and 18 wells.

Even though there was good news to report on crude oil prices, on revenue from lease sales, and on the prospect for increases in gas production, the news is not all good. Texaco U.S.A. announced that it will close its exploration and production office in Casper under a new nationwide restructuring plan. The plan will affect 44 Casper employees, nearly a fourth of Texaco's workforce in Wyoming. The restructuring should be completed by the fourth quarter of 1989.

Hotline Energy Reports, which had been in Casper since 1978, moved to Oklahoma City in February. Hotline employed 11 people in the Casper office.

Amoco Production, the State's largest crude oil and second largest natural gas producer, announced plans to transfer 22 Wyoming workers to New Mexico oil fields. Amoco is trying to sell 35 of its Wyoming fields which they consider marginally profitable.

The rig count historically drops at the beginning of the year; however, it was lower during the first quarter of 1989 than it has been in the past. If past trends hold up, the number of rigs at work should begin increasing in April or May, especially if the price of crude oil stays in the \$18 to \$20 range and if the demand for natural gas increases as expected.

Based on company data and on information compiled and published by Petroleum Information, the following significant exploration and development events occurred in Wyoming during the first quarter of 1989.

A. Exxon Corporation set a production string at their directionally-drilled 1 Collett Creek Unit well which bottomed in section 20, T.21N., R.118W. The test was designed to test

the Ordovician Bighorn Dolomite and the Mississippian Madison Limestone. Although the production string was set late last year, no additional details have been released by the company. The well is over two miles northeast of the nearest Bighorn production at Road Hollow Field.

B. Chevron U.S.A. completed a Jurassic/Triassic Nugget Sandstone well in section 6, T.15N., R.119W. in East Painter Reservoir Field. The 12-5A East Painter Reservoir unit well flowed 1.5 million cubic feet of gas, 343 barrels of condensate, and 429 barrels of water per day. East Painter Reservoir Field was discovered in 1979 and is currently the fourth largest oil-producing field and the sixth largest gas-producing field in Wyoming.

C. Anadarko Petroleum completed a new Dakota Formation producer on the southern Moxa arch in section 28, T.13N., R.114W. The 13-28 Taylor Ranch well flowed 300 barrels of oil, five barrels of water, and two million cubic feet of gas per day. The well is about two miles north of Dakota production in Luckey Ditch, Whiskey Springs, and Taylor Ranch Fields. Three weeks after this discovery, Anadarko Petroleum and Enstar Corporation purchased Maxus Exploration Company's 100 percent interest in the Taylor Ranch Unit for \$4.6 million. Anadarko and Enstar received three producing wells and about 1,900 undeveloped acres. Anadarko announced plans to drill two more tests in the area this summer.

D. Wildhorse Energy of Denver set production casing at the 2 Wadsworth-Federal 5-32 well in section 5, T.12N., R.113W. The objectives of the well were to test the Dakota, Mesaverde, and Frontier Formations. No other details are available.

E. Two new Dakota Formation producers were completed by ANR Production Company on the west side of Lincoln Road Field. The 1-17 Raptor Unit well in section 17, T.24N., R.111W. flowed 3.36 million cubic feet of gas, 635 barrels of condensate, and three barrels of water a day. The 1-18 Raptor Unit in section 18, T.24N., R.111W. flowed 587,000 cubic feet of gas and 307 barrels of condensate per day. These two new producers are a little over a mile from the nearest Dakota production.

F. Samedan Oil completed a Mesaverde step-out well from Siberia Ridge Field in section 24, T.21N., R.94W. The 1-24 Danno well flowed 400,000 cubic feet of gas and one barrel of condensate and water per day. The well is two miles east of the nearest Mesaverde production in Siberia Ridge Field.

G. Amoco Production has a new Tensleep Sandstone producer in Wertz Field. The 163 Wertz ABC Unit well in section 18, T.26N., R.89W. was completed pumping 708 barrels of oil and 9,236 barrels of water per day. Wertz Field was discovered in 1921 and is presently under-

going tertiary recovery. The field topped 100 million barrels of cumulative oil production during the first quarter of 1989.

H. BHP Petroleum reported two new Muddy Sandstone producers in Sun Ranch Field. The 4-22 Sun-Federal was completed in section 22, T.33N., R.86W. for an initial flowing potential of 300 barrels of oil and 450,000 cubic feet of gas per day. The 6-22 Sun Ranch-Federal in section 22, T.33N., R.86W. was completed for an initial flowing potential of 350,000 cubic feet of gas and 750 barrels of oil per day. The Wyoming Oil and Gas Conservation Commission shut-in Muddy Sandstone production in parts of sections 15 and 22 until a pressure maintenance unit can be formed.

I. BHP Petroleum is planning to build a \$25 million gas processing plant to handle gas from the Madison Limestone in its 24,000 plus feet deep wells in Madden Field (the 1-5 and 2-3 Bighorn wells in sections 3 and 5, T.38N., R.90W., respectively). The plant would be located near these two wells and would initially handle 25 million cubic feet of gas per day from the two wells. BHP hopes to expand the plant at a later date to process 100-150 million cubic feet of gas per day from the two wells. The plant could be completed late in 1990 and would remove carbon dioxide and sulfur from the gas.

J. Terra Resources completed a Muddy Sandstone producer in Five Mile Field in the Bighorn Basin. The 1-32 Federal-Five Mile in section 32, T.49N., R.93W. flowed 1.4 million cubic feet of gas and 451 barrels of oil per day. The new producer is over a mile southwest of Frontier production in Five Mile Field.

K. The 22-1 Magnolia-Federal well, completed by Presidio Exploration in section 1, T.57N., R.76W., pumped 100 barrels of oil with 43,000 cubic feet of gas and two barrels of water per day. The well is nearly a mile northeast of nearest Muddy production at Fence Creek Field. Presidio staked a location half a mile southeast of the discovery in the same section. The new well is projected to the Minnelusa Formation.

L. Conley P. Smith completed an offset well to the abandoned M-D North Field discovery. The 25-15 Morel-Federal well in section 25, T.53N., R.69W. pumped 202 barrels of oil with seven barrels of water per day. The well is just southwest of the Sun Exploration and Production M-D North discovery well which was abandoned in 1984 after it produced just 228 barrels of oil.

M. Dabros Properties completed a new Minnelusa Formation discovery in Crook County. The 24X-8 Hundahl well in section 8, T.53N., R.67W. pumped 195 barrels of oil and six barrels of water per day. The new discovery is a mile north of Minnelusa production at Sidner Draw Field and a mile northeast of Minnelusa production at Deadman Creek Field.

N. Robert E. Hudson produced 12° API gravity oil on tests of the Minnelusa Formation at the 43-21X Hundahl in section 21, T.53N., R.67W. The Minnelusa was tested through perforations between 1,878 and 1,910 feet, but the production rates were not revealed. The well is currently shut-in.

O. EP Operating pumped 282 barrels of oil with 9,000 cubic feet of gas and six barrels of water per day from their 22-24 Gruenfelder well in section 24, T.48N., R.72W. The discovery is around three miles southwest of Minnelusa production at Rourke Gap Field and over two miles northeast of Minnelusa production at Oxbow Field.

P. The U.S. Department of Energy started steam injection in mid-January as the second phase of a project in Teapot Dome Field. The second phase of the project, which expands the 20 acres in the first phase to 80 acres, targets 33° API gravity oil in the Shannon Sandstone at 250 to 300 feet. The first phase of the project reduced residual oil saturation from 50 percent to 15 percent and increased oil recovery by a factor of four. Three more phases of the project will be implemented at the rate of one per year and the project will eventually cover 400 acres.

Q. Three more producers were completed in the Sand Dunes Field area during the first quarter of 1989. Kerr-McGee Corporation's 11-7 Sand Dunes-Federal well in section 7, T.36N., R.75W. flowed 471,000 cubic feet of gas and 406 barrels of oil per day from the Dakota Sandstone. Kerr-McGee's 32-25 Federal well in section 25, T.36N., R.76W. reportedly is capable of daily production of 400 to 450 barrels of oil from the Muddy Sandstone based on a drillstem test. Marathon Oil is producing 400 barrels of oil per day from the 6-19 Sand Box well in section 19, T.36N., R.75W. from an undisclosed interval.

R. W.A. Moncrief, Jr. completed the 28-1 Popskull well in section 28, T.35N., R.75W. as a new Muddy Sandstone discovery. No details are yet available on this discovery. Presently there is no production in this township.

S. Marathon Oil found a new pay in Big Medicine Bow Field. The 4-25 Big Medicine Bow Unit well in section 25, T.21N., R.79W. pumped 73 barrels of oil with 7,000 cubic feet of gas and 24 barrels of water per day from the Dakota Sandstone. The field also produces from the Sundance Formation and the Tensleep Sandstone.

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COAL UPDATE

Preliminary figures recently released by the Wyoming State Inspector of Mines indicate that Wyoming's coal mines set a new all-time high production record in 1988. The 163.6 million short tons produced in 1988 are 17.1 million tons (or 11.7 percent) higher than the previous record of 146.5 million short tons set in 1987. Wyoming's national ranking in coal production will not be known until Kentucky releases its final 1988 production report. Since West Virginia's coal production was about 142.7 million short tons in 1988, Wyoming production is well ahead of the third leading coal-producing state in the Nation.

Coal production surged in the Powder River Basin as 142.4 million tons were produced. This was a 13.8-million ton (10.7 percent) increase over 1987 production. Between 1987 and 1988, coal production in the Hanna Basin recorded the largest percentage increase (60.4 percent) of the major coal regions in the State. Production increased from 2.2 million tons to 4.1 million tons. Green River Basin production increased by about 0.4 million tons and production from the Hams Fork Region (Lincoln County) increased by 1.1 million tons. Coal production from the three underground mines operating in 1988 was 1.1 million short tons, an increase of one million tons over 1987's production. Most of the increase in underground production was from Cyprus Shoshone Coal Company's mine in the Hanna Basin as this was the first full year of deliveries on their new contract. Bitter Creek Resources' Stansbury mine north of Rock Springs became Wyoming's newest coal mine and the State's third underground mine in 1988.

Coal production from Campbell County continued to increase in 1988 with the 135.7 million short tons representing an 11 percent increase over the 122.3 million tons produced in 1987. The 14 surface mines in this county accounted for 83 percent of Wyoming's total production; total production from the 17 Powder River Basin mines accounted for 87.1 percent of the State's total production in 1988. Coal production from the Powder River Basin has dominated Wyoming coal since 1977 and annual increases have been recorded each year since 1969. In contrast, coal production from southern Wyoming counties appears to have leveled off since reaching a peak in 1981.

Thunder Basin Coal Company's Black Thunder mine remained the largest producer in the State in 1988 with 24.9 million short tons produced. Kerr-McGee Coal Corporation's Jacobs Ranch mine ranked second with 14.5 million tons followed by Cordero Mining Company's Cordero mine (13.5 million tons), Amax Coal Company's Belle Ayr and Eagle Butte mines (13.3 and 12.9 million tons, respectively), and Carter Mining Company's Caballo and Rawhide mines (12.8 and 10.8 million tons, respectively). Only 8 coal mines in

Wyoming experienced a drop in production between 1987 and 1988, including three Powder River Basin mines: Kerr-McGee Coal Corporation's idled Clovis Point mine, the Big Horn mine in Sheridan County, and the Coal Creek mine. The Black Thunder, Jacobs Ranch, and Rochelle mines experienced the largest production increases between 1987 and 1988.

Total employment at Wyoming coal mines increased slightly in 1988, with a gain of 110 employees (2.5 percent) over 1987 employment. The employment in the Powder River Basin mines continued to decrease in 1988, but employment in southern Wyoming mines increased for the first time since 1980. Ten coal mines in the Powder River Basin accounted for a loss of 116 jobs and a drop of 4 percent in employment. The increased employment in southern Wyoming was primarily caused by an expansion of underground mining in Sweetwater and Carbon Counties. Employment in underground mines increased by 168 between 1987 and 1988; employment in surface mines decreased by 58 during this same period.

The surge in Wyoming coal production in 1988 has necessitated a revision of our previous five-year production forecast made in January, 1989, (see table in Overview Section of this Minerals Update article). Total production in 1989 is forecast to increase slightly as the good market conditions experienced in 1988 continue. Production will level off in 1990 and then show modest yearly increases through 1992 as demand for low-sulfur coal rises in response to increased demand for coal-fired electricity. Estimates of contracted coal production are less than estimates of actual coal production because spot sales of coal will continue as a significant percentage (5.5 percent) of the total production.

Deliveries of Wyoming coal to electric utility plants in the last quarter of 1988 were well above deliveries made during the last quarter of previous years and helped account for the increased coal production for the year. The large amount of unreported tonnage (about 6.5 million tons) for 1988 reflects an increase in the use of coal for industrial and commercial purposes as well as an increase in the amount of coal delivered to utility companies in relatively small amounts for test burns in advance of spot or contract sales. In addition, deliveries to electric utility plants rated at less than 50 megawatts are not reported in the monthly deliveries. Of the total coal deliveries made to 19 different states in 1988, only Illinois and Minnesota used less Wyoming coal than in 1987. Significant increases in deliveries to electric utility plants in Texas, Wyoming, Missouri, and Indiana were noted in 1988.

In coal transportation news during the first quarter of 1989, Energy Transportation Systems, Inc. (ETSI) was awarded treble damages of \$1.035 billion from Santa Fe Southern Pacific Corporation (SFSP) following a Federal jury

trial in Texas. ETSI had filed lawsuits against seven western railroad companies alleging that the companies had conspired to block ETSI's proposed 1,800-mile coal slurry pipeline back in the 1970s. Completion of the ETSI-SFSP case nearly completes the settlement of these various lawsuits brought by ETSI. Six of the other railroads involved in the litigation with ETSI have already settled out of court; the SFSP case is the first to be decided by a jury trial. The \$1.035 billion award will apparently be reduced by \$285 million from awards made to ETSI by the other six railroad companies; this leaves SFSP owing ETSI \$750 million. SFSP announced that they would appeal the verdict.

Development in the Hanna Coal Field

A report late last year that Rosebud Coal Sales Company would be laying off workers and ending major coal production was confirmed in January as Rosebud announced that 49 employees would be laid off effective February, that production would be scaled back to supply retail sales only, that no trainloads of coal would be handled any more, and that the remaining workforce of 18 would be involved in reclamation work plus the retail sales. Rosebud's only major coal supply contract (with Iowa Public Service Company) expired in December, 1988. The Rosebud mine has operated since 1961 and has produced a total of 32.6 million tons of coal in that 28 years. Production peaked at 2.9 million tons in 1978 and the mine employed a maximum of 243 workers in 1979.

Last quarter's story on Arch of Wyoming's Seminoe 2 mine was also confirmed in late March when the company announced the layoff of 31 employees and the impending closure of the Seminoe 2 mine following expiration of a contract with Kansas Power and Light Company (KP&L). Arch also announced that a 9-month, 650,000-ton coal contract with KP&L had been signed for Arch's recently-acquired Medicine Bow mine west of Hanna. In December, Arch of Wyoming purchased Union Pacific Minerals' (UPM's) share of Medicine Bow Coal Company's Medicine Bow mine, a joint venture of UPM and Arch. Arch of Wyoming also announced that 30 additional employees would be hired at Medicine Bow as production under the new KP&L contract begins. Arch will also supply 360,000 tons of coal per year to Iowa Public Service Company from Medicine Bow. Evidently this is the 10-year contract formerly held by Energy Development Company (EDC) but taken over by Arch of Wyoming when they purchased EDC. This contract is due to expire in 1993.

Development in Western and Southwestern Wyoming

In early January, the completion of the proposed merger between Utah Power and Light Company (UP&L) and PacifiCorp was announced. Under the merger, PacifiCorp would have two

divisions. UP&L (serving 525,000 customers in Utah, western Wyoming, and Idaho) and Pacific Power and Light Company (PP&L) (serving 687,000 customers in Idaho, Wyoming, Oregon, Washington, Montana, and California).

Bitter Creek Resources' newly-opened Stansbury underground mine north of Rock Springs is apparently supplying coal to the Jim Bridger power plant east of Rock Springs. Marketing reports indicated that 8,000 tons of 10,740 Btu/pound coal was supplied to Jim Bridger in December, 1988. Delivered price for the coal was \$18.41 per ton (85.7 cents per million Btu).

Developments in the Powder River Basin Coal Field

In February, Western Fuels Association (WFA) and Phillips Coal Company announced formation of a limited partnership called Dry Fork Coal Company. Dry Fork plans to open a new surface coal mine north of Gillette. Construction of the Dry Fork mine is expected to begin in the latter part of 1989 and coal production is expected to start in late 1990. Initially, the mine will produce less than 3 million tons a year; capacity would presumably increase incrementally as market conditions dictate until reaching a maximum permitted capacity of 15 million tons per year. The mine is located north of the Fort Union mine, east of Eagle Butte, and southeast of the Rawhide mine and will supply coal to the Laramie River Station north of Wheatland, Wyoming.

Coal from the Dry Fork mine will initially replace coal from a 2.7-million ton-per-year contract that was not renewed during a price renegotiation between WFA and Cordero Mining Company (a subsidiary of Sun Coal Company). Dry Fork Coal Company will operate the mine with Western Fuels-Wyoming (a subsidiary of WFA) as the general partner and North Gillette Coal Company (an affiliate of Phillips Coal Company, a wholly-owned subsidiary of Phillips Petroleum Company) as a limited partner. Western Fuels Association is a fuel-purchasing cooperative of consumer-owned utility companies, including Basin Electric Power Cooperative of Bismarck, North Dakota, and Tri-State Generation and Transmission Association of Denver, Colorado.

Several changes in the corporate structures of coal companies in Wyoming were noted in the first quarter of 1989. In February, Elk River Resources changed its name to Sun Coal Company, a subsidiary of the Sun Company. Cordero Mining Company, operator of the Cordero coal mine south of Gillette, remains a subsidiary of Sun Coal Company. In another corporate development, Panhandle Eastern Corporation, a partner in North Antelope Coal Company's North Antelope mine in southern Campbell County, recently agreed to sell its 50 percent interest in North Antelope to its other partner in the joint venture, Powder River Coal Company, an operating unit of Peabody Holding Company. Pan Eastern

Coal Company, a wholly-owned subsidiary of Panhandle Eastern Corporation, was an operating partner with Powder River Coal Company at the North Antelope mine. Peabody Holding Company is also the parent company of its Rochelle Coal Company subsidiary that operates the Rochelle mine in the same area as North Antelope.

In the first quarter of 1989, Cordero Mining Company's Cordero mine passed a significant coal production milestone as the mine shipped its 100 millionth ton of coal. Cordero becomes the fifth coal mine in the Powder River Basin to produce more than 100 million tons. Only Amax Coal Company's Eagle Butte and Belle Ayr mines, Kerr-McGee Coal Corporation's Jacobs Ranch mine, and Thunder Basin Coal Company's Black Thunder mine have each produced more than 100 million tons of coal.

Coal Contracts

In addition to the coal supply contract noted for Arch of Wyoming and the coal deliveries to Jim Bridger from the Stansbury mine, several short-term or spot coal supply agreements were signed in the first quarter of 1989. A summary of this contract activity follows:

1) Mobil Coal Producing, Inc. will supply 1.3 million tons of 8,500 Btu/pound coal to Lower Colorado River Authority's Fayette No. 1 generating plant in Texas. The coal will be delivered from February, 1989, through January, 1990. Price for the spot coal sale was reportedly \$3.65 a ton F.O.B. the Caballo Rojo mine.

2) Thunder Basin Coal Company, a subsidiary of Arco Coal Company, will furnish up to 1.2 million tons of spot coal to Southwestern Public Service Company's Roy Tolk generating plant at Muleshoe, Texas, in 1989. The coal can be from either the Coal Creek mine (8,350 Btu/pound coal) or the Black Thunder mine (8,900 Btu/pound coal) and will be delivered by Burlington Northern Railroad (BN) and Santa Fe Railroad.

3) Thunder Basin Coal Company will furnish up to 650,000 tons of coal in 1989 to Nebraska Public Power District's Sheldon, Nebraska, generating plant. The agreement specifies a delivered price of \$13.76 per ton for 8,900 Btu/pound coal from the Black Thunder mine. BN will transport the coal.

4) Northern Indiana Public Service Company (NIPSCO) continued to purchase spot coal on a monthly basis. Amax Coal Company's Belle Ayr mine provided 70,000 tons of coal in February and 81,000 tons of coal in March to unspecified NIPSCO generating plants in Indiana. Cordero Mining Company's Cordero mine also provided 20,000 tons of coal in March to unspecified NIPSCO generating plants in Indiana.

5) Lower Colorado River Authority (LCRA) recently held open bids on 6-month or 12-month

coal supply contracts for Fayette generating units 1, 2, and 3. Although no contract has been awarded pending LCRA examining longer term arrangements, published bids for the 2.5 million tons of spot coal were received from Rochelle Coal Company's Rochelle mine, Amax Coal Company's Belle Ayr mine, Carter Mining Company's Caballo mine, and Sun Coal Company's Cordero mine. The bids were between \$3.50-\$4.70 per ton.

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INDUSTRIAL MINERALS UPDATE

The U.S. Bureau of Mines (USBM) has released its annual report on the mineral industry of Wyoming in 1988. According to the USBM, the value of Wyoming's nonfuel mineral production increased 17 percent over 1987 due to greater production values for soda ash and other refined trona products and a small increase in production value for bentonite. Industrial minerals account for all of Wyoming's nonfuel mineral production. Wyoming is now ranked 13th among the states in the value of nonfuel minerals, an increase over 1987's ranking of 15th.

Aggregate

The production of construction aggregate (sand, gravel, and crushed rock) in Wyoming began to increase in March, 1989, as some dryer and milder weather returned to the State following February's cold snap. Highway construction and repaving projects consume most of Wyoming's construction aggregate. Other users are building contractors, railroads (for ballast), and general contractors for defense-related projects as well as other projects.

The Nebraska Highway Department (NHD) is looking for quartzite for highway surfacing in western Nebraska. A hard quartzite known as the Sioux Quartzite is used in eastern Nebraska, and the NHD is looking for a similar rock for the western part of the State. The Industrial Minerals and Uranium Division of the State Geological Survey suggested several possible quartzites in eastern Wyoming, including a rock found in Guernsey Stone Company's quarry near Guernsey. These quartzites are now being tested by the NHD.

Bentonite

The 1988 bentonite production increased over 1987 levels. Figures released by the U.S. Bureau of Mines show an estimated 2,345,000 short tons of bentonite produced in 1988, compared to 2,128,000 short tons in 1987, and

1,762,000 short tons in 1986. In a related item, American Bentonite, Inc. began development of a mine near Poison Spider School, west of Casper.

Bentonite production remained low during early 1989 due to low demand for oil well-drilling mud, the prime use for bentonite. Wyoming, however, remains the Nation's leading bentonite producer.

Cement

In early 1989, Lone Star Industries and a subsidiary of Centex Corporation formed a joint venture, Mountain Cement Company, for cement production in the Rocky Mountain region. This joint venture owns and operates the cement plant at Laramie. The plant is currently operating near its capacity of 500,000 tons per year.

Gypsum

The production of gypsum from three mines in Wyoming continued in early 1989. The two Bighorn Basin plants manufacture wallboard while the gypsum mined near Laramie is used in the production of Portland Cement. Gypsum production is increasing nationally and should also increase in Wyoming in 1989.

Leonardite

Leonardite is an industrial mineral used in well-drilling fluids. It is a soft, earthy, brown, diagenetic material produced from the weathering of coal or lignite. It has also been used for water treatment and in wood stain. Black Hills Bentonite began marketing this material in 1988.

Limestone

Limestone quarried in Wyoming is used for construction aggregate and for power plant emissions control. Although limestone is also used in the refining of beet sugar, the limestone used in the sugar plant at Lovell, Wyoming, comes from Warren, Montana, about 5 miles north of Frannie, Wyoming. Limestone used in the sugar plant at Torrington, Wyoming, comes from Pringle, South Dakota. Limestone used in the sugar plants at Mitchell and Scottsbluff, Nebraska, is transported through Wyoming from Warren, Montana.

Phosphate, Sulfur, and Fertilizer Production

Phosphate and sulfur are combined with other chemicals at Chevron Chemical Company's Rock Springs plant to produce fertilizer. No phosphate is currently mined in Wyoming. The phosphate used by Chevron is mined north of Vernal, Utah, and shipped to the Rock Springs plant by slurry pipeline. The sulfur used at the fertilizer plant comes from the refining of

Wyoming sour gas. Chevron's plant increased production in 1988 and may increase production again in 1989.

Trona

The production of soda ash and other sodium mineral products from mined trona in Wyoming increased dramatically in 1988 and should continue at record levels in 1989. This increase reflects the demand for soda ash as a substitute for caustic soda in some industrial processes. An increase in the demand for sodium cyanide (used in the refining of gold and other metals) will account for future production increases as FMC is planning to construct a 60-million-pound per year sodium cyanide plant near its soda ash plant west of Green River.

The export market for soda ash is for the production of glass. This market shrank in the 1982 recession, and although the demand for all kinds of glass is increasing, the market has not yet completely recovered.

Volcanic Ash

The State Geological Survey is continuing its study of a high-silica volcanic ash (initially reported as "tripoli") in support of a block grant to the Town of Guernsey from the Wyoming Economic Development and Stabilization Board. Other volcanic ash deposits in Wyoming, including pumice and pumicite are not as white, fine grained, or as high in silica as this deposit (Harris and King, 1986). Possible uses for this product are also under study by the State Survey, and a report on the occurrence and development potential of this product is in preparation.

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URANIUM UPDATE

There are currently three companies mining uranium in Wyoming. Two companies produce uranium by in situ methods from deposits in the Powder River Basin, and one company mines and mills uranium at a location in the Shirley Basin. Another company has announced plans to open an underground mine on Green Mountain and process ore from the Crooks Gap area, both south of Jeffrey City.

Although an early bill to reduce uranium severance tax rates from 5.5 percent to 2 percent failed to pass, a bill easing the severance tax was passed by the 1989 Legislature and signed by Governor Mike Sullivan. The bill

reduces the severance tax rate from 5.5 percent to 4 percent with an additional decrease of 2 percent for new uranium production between June 8, 1989, and July 1, 1991.

Projects to reclaim abandoned uranium mining lands in the Gas Hills mining area east of Riverton may cost between \$60 million and \$85 million between now and the end of 1996. Funds for these projects will come from Federally collected coal taxes. Wyoming has received about \$400 million from these taxes, which are for reclamation of abandoned mined lands.

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METALS AND PRECIOUS STONES UPDATE

Gold production during 1988 was minor and amounted to less than a few hundred ounces recovered from gold placers. Interest in gold, however, is picking up in Wyoming based on several companies' announced plans to conduct reconnaissance exploration in the State during the next few months. This interest is reinforced by the announcement of some gold projects in the State.

It was reported by the Mining Record (3/8/89) that Royal Gold, Inc. of Denver, signed an option agreement with Henrietta Mines, Inc. of Vancouver and Kirkwood Exploration of Casper to obtain rights to purchase Wyoming Gold, Inc. Wyoming Gold, Inc.'s principal asset is the Copper King mine located in the Silver Crown district, 20 miles west of Cheyenne in Laramie County. The Copper King mine is in a Proterozoic copper-gold porphyry hosted by quartz monzonite and granodiorite (Klein, 1974). Drilling results prior to 1973 indicated the presence of a surface-minable deposit containing 35 million tons of ore averaging 0.21 percent copper and 0.022 ounce/ton gold. More recent drilling outlined a 4.5-million-ton deposit averaging 0.044 ounce/ton gold (Stockwatch, 1987). The Mining Record (3/8/89) indicated the Copper King has a 3.6-million-ton resource averaging in excess of 0.04 ounce/ton gold and 0.4 percent copper.

The Casper Star-Tribune (3/18/89) reported that American Mining and Milling of Gillette was planning to resubmit an application to mine gold along the western flank of the Bighorn Basin near the Clark's Fork River in Park County. At this locality, placer gold is found with abundant garnet along the Sand Coulee Creek north of Cody. The original source of the gold is unknown, but may be from conglomerates in the Willwood Formation. Similar conglomerates in the Cedar Mountain Wilderness Study Area north of Thermopolis along the southeastern flank of the Bighorn Basin were recently tested by the U.S. Bureau of Mines. These samples yielded

Table 2: Assay results of some samples recently collected by the Geological Survey of Wyoming

Sample Ag (ppm) Number	Description CU (%)	Au (ppm)		
BP2-88	Quartz vein with primary sulfides and some boxworks from Bradley Peak, Seminoe Mountains	28.0	18.0	0.39
BP3-88	Quartz vein with sulfides from Bradley Peak	20.0	18.0	0.38
LL11-88	Copper-stained gneiss collected from pit along Big Hermit Gulch, South Pass	0.87	ND	0.058
MD8-88	Vein from metatonsalite porphyry near Highway Department Station, South Pass	2.3	19.0	0.88

ND = not detected

concentrates containing 20 ppm (parts per million), 30 ppm, and 100 ppm gold (Larsen et al., 1988).

During the past quarter, several samples collected by the Geological Survey of Wyoming were assayed. By far, the more interesting samples were collected from the Penn mines in the Seminoe Mountains greenstone belt (see table above). This is the same area where the State Geological Survey collected samples in 1981 that assayed as high as 2.87 ounces/ton gold (Hausel, 1989, p. 148-150). The Survey is planning to start a research project in this greenstone belt this summer.

Several other samples were collected for assay, including selected titaniferous black sandstones from the Mesaverde Formation (Cretaceous) in the southern Bighorn Basin and conglomerates from the Flathead Sandstone (Cambrian) on the southeastern flank of the Rawlins uplift. These samples contained no detectable gold.

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Spring Agricultural Outlook

Wyoming is not currently in a full fledged drought, however lack of subsoil moisture and reduced snow pack across most of the state this spring gives cause for concern. The May 1 USDA pasture and range conditions were rated only poor to fair for the U.S., the second worst on record and several points below last year's estimates. States hardest hit by the drought include North Dakota, Nebraska, Kansas, and New Mexico. Pastures and ranges were rated only slightly better in Wyoming, South Dakota, Utah, Colorado, Oklahoma, and Texas.

Mid-May rains across some of the region brought temporary relief, but many areas will require additional timely rains to maintain grazing prospects. Reduced mountain snow pack will sharply reduce stream flow later this summer, particularly for producers dependent on irrigating from sources other than upstream reservoirs.

Compounding potential drought problems in the west, U.S. Hay stocks on May 1 fell by one-third from a year earlier to 17.6 million tons. This is the lowest carry-over since 1960. Current poor sub-soil conditions and a poor outlook for a dependable supply of irrigation water in much of Wyoming, make this situation more critical, since stockman may have to depend upon some supplemental feeding unless we receive consistent summer rainshowers.

GRAINS

Smaller crops and higher prices characterize the outlook for grains in the coming crop year. Although there has not been back-to-back major droughts in the U.S. in this century, there was a major drought in 1988, and the outlook for 1989 is highly uncertain due to general dry conditions this spring. Subsoil moisture is generally short throughout much of the feed grain producing areas of the mid-west. There has been enough moisture to bring the spring crops up, but continued rains will be necessary throughout the summer in order to prevent a repeat of last year, when the corn crop barely reached 4.9 billion bushels.

The volume of U.S. exports is projected to decline marginally in the coming crop year, although total value should be higher than year-ago levels.

Although world-wide wheat production prospects are not unfavorable, smaller beginning stocks and continued high rates of usage will result in smaller world ending stocks. The biggest drop in ending stocks is among the major exporting countries, where ending stocks have declined by nearly two-thirds since 1986-87.

The effect of last fall and winter's drought and resulting winter kill, will make this year's hard U.S. red winter wheat crop the smallest in 25 years. Reports from some winter wheat areas in Kansas and Montana indicate over

one-half of the winter wheat acres either abandoned or in need of replanting. Harvest will have begun in some areas of the southeast and Texas by the time you read this, however major harvesting will not be in full swing until June and July. Much of the wheat crop still needs some moisture in order to fill and achieve yield potential.

Wheat prices should be somewhat higher in the coming marketing year. The smaller 1989 domestic production, plus continued strong export demand will keep prices \$.20-\$.30/bushel above 1988 levels.

If we have normal weather the remainder of the spring and summer, 1989 should be a rebuilding year for U.S. corn stocks. Assuming normal yield trend projections, the 1989 crop should approach 7.3 billion bushels, and ending stocks could approach 10 billion bushels, an increase of 300 million bushels over year ago levels. If something close to these figures materialize, corn prices could fall \$.50-\$.60/bushel and cash prices approaching the loan rate of \$1.65/bushel at harvest.

LIVESTOCK

The outlook scenario for livestock parallels what was said about grain. As of this writing, there is a large concern about drought and the resulting impacts on the livestock sector. Range and pasture conditions and subsoil moisture throughout much of the west are below normal, and without consistent rains this summer, some liquidation of cattle herds may have to take place, plus supplemental feed costs will continue to rise.

Choice fed steer prices reached the \$80 per cwt. mark in late March, supported by smaller slaughter supplies and increased foreign beef purchases. Despite seasonal increases in slaughter, prices during May continued to trade in the high \$70's.

Larger than seasonal increases in beef output will push fed cattle prices lower by early summer. Beef production during April-June may average 7 percent above the previous quarter, followed by a further 2 percent rise during summer quarter. Choice steer prices are expected to decline into the lower \$70's by mid-summer, but a rebound to the high \$70's likely by year-end.

Cow slaughter during the January-March period averaged 1 percent above a year earlier. That increase resulted from a continuation of larger dairy cow slaughter following last summer's drought. However, by mid-March beef cow slaughter was sharply higher with much of the increase concentrated in the Central Plains region. Dry pastures and lack of water in stock ponds has encouraged inventory culling that may continue if conditions do not improve by late spring. Cow slaughter is expected to average

4 to 5 percent below a year earlier this spring and summer, but could move higher if the drought widens and intensifies.

Feeder cattle supplies remain historically small, but prices for 700 to 800 pound feeder steers declined nearly \$10 per cwt. from last winter's highs in the mid \$80's. Record large feedlot placements during the January-March quarter resulted from deteriorating wheat pastures in the Southern Plains. The rapid, early movement of cattle off dry pastures helped pressure prices lower, although feeder cattle supplies are about 3 percent below last year and the smallest April 1 count in more than 15 years.

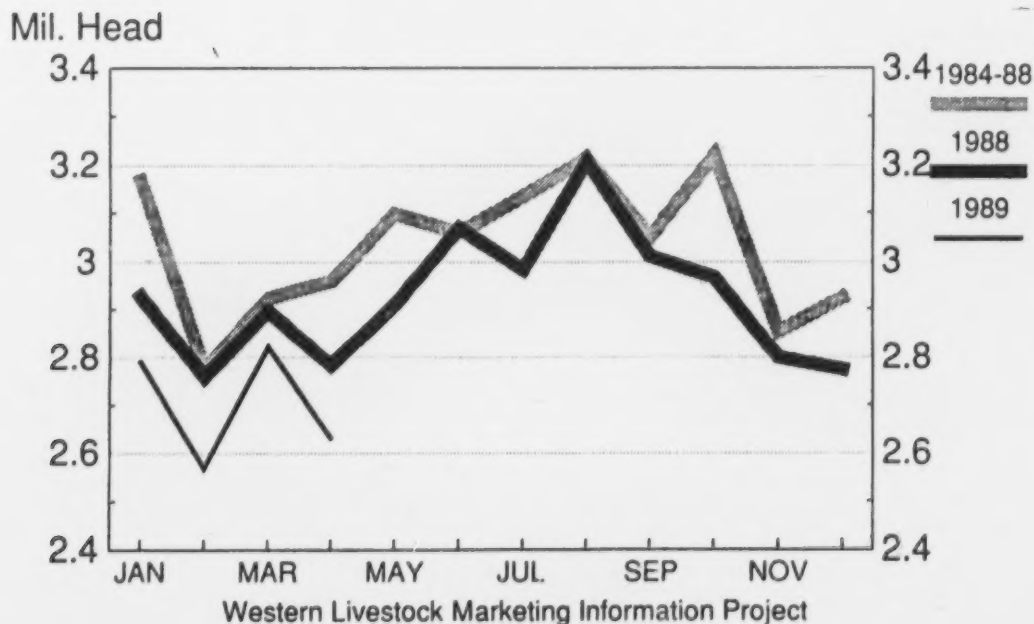
In addition with early runs of feeder cattle in many areas, tight cattle feeding margins, higher feed costs, and prospects for lower fed cattle prices this summer added downward pressure to the feeder market. Returns to cattlemen feeding 750 pound feeder steers averaged about \$12 per head short of covering costs during the first four months of 1989.

Despite smaller supplies, feeder cattle prices will continue to be affected by changes in feed conditions and cattle feeding margins. Timely late spring rains in the Central Plains that rejuvenated pastures and improve feed grain crop prospects would provide major support to feeder cattle prices. Prices for 700 to 800 pound feeder steers are expected to trade mostly in the mid \$70's this summer before climbing back into the lower \$80's this fall. Calf prices will trade mostly in the \$90-\$95 range during the last half of the year.

In summary, the agricultural outlook for Wyoming is primarily linked with upcoming weather patterns, both in-state and what occurs in the major feed grain producing areas of the United States. It will be more important than normal for producers to keep a sharp eye on U.S. and world-wide weather.

Robert D. Carver
Extension Economist
University of Wyoming

COMMERCIAL CATTLE SLAUGHTER MONTHLY



Job Openings Outlook

RESPIRATORY THERAPISTS

Respiratory Therapists treat patients with breathing problems. The field of respiratory therapy has two levels -- the therapist and technician levels. Therapists and technicians work under the direction of a qualified physician. Using sophisticated medical equipment, they help people with lung disorders such as asthma, emphysema, pneumonia and bronchitis. Working as a member of a critical care team, they may treat individuals in life threatening situations ranging from severe head injuries to chest wounds. Others spend time working in pulmonary laboratories, assisting the physician in determining the type and extent of the patient's disease by measuring lung volumes or administering radioactive gases or aerosols. Therapists are often called upon to offer advice and help in deciding which course of care to prescribe.

Respiratory therapists must have above average manual dexterity; ability to make decisions on the basis of facts; thoroughness in their work; an interest in science and working for the good of others; and a willingness to work with and help other people. Respiratory therapists must have the ability to use various types of inhalation equipment and to deal with people under stress. Clerical ability is necessary to keep accurate records.

Formal training programs are available at 2-year and 4-year colleges. Most technician programs last 18 months to 24 months.

Graduation from a respiratory therapy program is not required but is strongly stressed. Once formal training is completed, both levels of respiratory care practitioners can enter the credentialing process by applying to the National Board for Respiratory Therapy. Therapist candidates and technical graduates must also pass an examination and meet specific requirements to qualify to receive the credential "Certified Respiratory Therapy Technician." For more information, contact the National Board for Respiratory Care, 11015 W. 75th Terrace, Shawnee Mission, Kansas 66214, phone: (913) 268-4050.

A 40-hour workweek, including holidays, weekends, and shift work is typical. Employers include hospitals, medical clinics, ambulance services, nursing homes, universities and sometimes private individuals.

This is a medium occupation in Wyoming, employing about 90 therapists. Average entry rate is between \$8.00-\$9.00 per hour. Average maximum is between \$10.00-\$16.00 per hour, depending on employer and educational background.

The outlook for respiratory therapists is a slight shortage of qualified applicants. Most workers in the state are neither registered nor certified. Inflow of out-of-state workers could create competition, but because of increasing advances in technology, increasing demand for specialization, newborn care and cardiopulmonary technology, and growth of health services, this will not occur for some time. Nationally, employment is expected to grow much faster than the average for all occupations as a result of

population growth, greater health consciousness, and widespread accessibility of hospital and surgical care through public and private health insurance. Employment prospects should be excellent for graduates of formal training programs. Those without training will face stiff competition.

FALLERS AND BUCKERS

Fallers and buckers work in the woods where they fall trees and saw them into specified log lengths. Usually two men work together as the cutting crew. They select the best direction to fall trees and use power chainsaws to saw cuts and to fix the direction of fall.

Fallers and buckers work in forests under noisy and hazardous conditions. There is danger from falling limbs, trees, and rolling logs. They are exposed to hot and cold temperatures, rain, mud, insects, and vibration of the saws. Work time is often lost due to weather conditions and fire danger. Fallers and buckers normally provide their own chain saws, hard hats, and caulk boots. In addition to regular working hours, most logging jobs require one to three hours travel time to the work site. Employers include independent log contractors, lumber mills, and plywood plants.

Fallers and buckers need above average strength and endurance to handle the chainsaw and move about through rough terrain. They need good hand and wrist movement, and good eye-hand coordination. Fallers and buckers must be able to use specialized equipment and possess knowledge about scaling and tree species. They must also understand the regulations associated with their work.

Employees must be 18 years of age and have the necessary physical strength to perform the work. Positions are often filled by promotion based on seniority and qualifications. Most employees are loggers who have worked their way up through the hierarchy of jobs in the woods, beginning as chokersettlers. Usually previous logging and chainsaw experience is specified to become a faller or a bucker.

This medium occupation in Wyoming employs about 280 fallers and buckers. Wages are earned on a piece work basis. Entry-level workers may earn about \$860-1,030/month. Maximum wages range from \$1,550-2,060/month.

Although there is a surplus of applicants, there is a shortage of qualified workers. Outlook depends on the supply of timber available in the state, interest rates and the demand for housing construction nationwide. In addition, many of the jobs that have been done by hand will become automated, and will not require as many workers as in the past. Because of the continued growth of log exports, the outlook for fallers and buckers is somewhat better than that for the rest of the lumber and wood products industry. Currently, poor economic conditions have caused a severe slump. Historically, the lumber industry has been very dependent on the national economy and the housing industry.

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Wyoming Coincident Indicators Index

The fourth quarter 1988 seasonally adjusted Wyoming Coincident Indicator Index (WCII) continued to hold at a level maintained now for ten quarters since mid-1986. For this ten-quarter period the index has been quite stable and shows a very slight upward trend. The WCII is derived using several economic variables which tend to change concurrently with the overall Wyoming economy. The index is computed quarterly by the Division of Research and Statistics, Department of Administration and Fiscal Control.

The WCII is composed of four variables which are: 1) total State employment, 2) total wages reported for the quarter, 3) total sales and use tax collections, and 4) an industrial index. The industrial index is a composite of variables which represent three important Wyoming industrial sectors. For the industrial index, mining is represented by the number of active oil well drilling rigs; the agricultural sector is represented by an index of prices received for all Wyoming agricultural commodities; and tourism is represented by the total volume (in gallons) of motor fuels plus gasohol sold.

An annual comparison of seasonally adjusted values (fourth quarter, 1988, to the fourth quarter, 1987), shows a decline for the industrial index, and sales and use tax collections which are off 8.4 and 5.3 percent respectively from the previous year. The other two variables are up from the fourth quarter of 1987 with total reported wages registering a 5.3 percent increase and total employment a 1.7 percent increase. The 8.4 percent decrease in the industrial index is due to a 48.9 percent decrease in the oil drilling rig count. Gallons of motor fuels plus gasohol sold also decreased a negligible 0.3 percent while the agricultural commodities price index increased by 9.9 percent. The healthy increase in the agricultural commodities index was overwhelmed by the extreme weakness in the oil drilling count. Even with the strong negative showing for the industrial index, the overall fourth quarter 1988 WCII was quite stable and registered a 0.2 percent increase from the fourth quarter of 1987.

On a quarterly basis, the fourth quarter 1988 seasonally adjusted WCII was up by 1.1 percent from the third quarter of 1988. Leading the increase was a 5.1 percent boost in total covered wages and a 3.9 percent increase in total employment. On the negative side the industrial index was down by 5.5 percent, and sales and use tax collections were down by 2.7 percent. The weak showing for the industrial index was again due to an extreme decline in the number of active oil well drilling rigs. The rig count was off a whopping 33.5 percent since the third quarter. The other two industrial index components registered increases. The agricultural commodities index increased 2.4 percent, and total gallons of motor fuels plus gasohol sold increased by 1.7 percent.

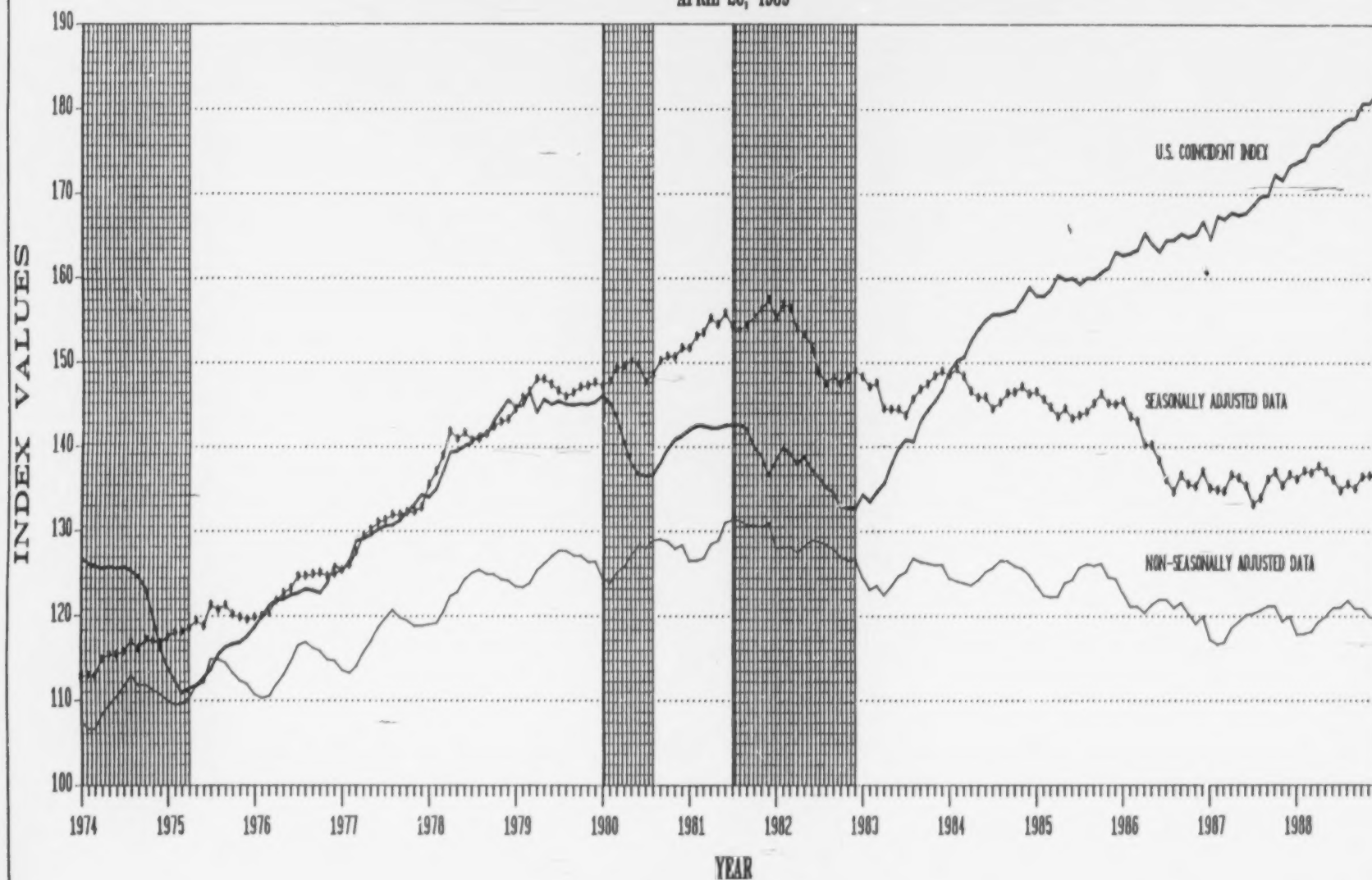
The seasonally adjusted WCII has now held at a stable level for two and a half years with indications of a very slight upward trend. For the fourth quarter the index rebounded slightly from the third quarter reading which had slipped a little. It continues to look as if the economy has levelled off at the bottom of an economic cycle and may be advancing very slowly. The industrial index is down 8.4 percent from the previous year mostly due to extreme weakness in oil well drilling activity. Sales and use tax collections are also down 5.3 percent from the previous year, but on the encouraging side, total reported wages are up 5.3 percent and total employment is up 1.7 percent. Overall the index held steady with the level of the previous year. Another encouraging signal is the 1.1 percent increase in the fourth quarter WCII over the third quarter. This quarterly gain was somewhat of a surprise given the severe weakness in the oil drilling rig count. On the cautionary side, continued weakness in oil well drilling activity may have a negative effect on the first quarter index.

Early signals for the first quarter of 1989 indicate that the overall WCII may slip again, though it should remain in the same range as it has been for the previous ten quarters. On a year-to-year basis, employment may be about even with the previous year level. Sales and use tax collections are down 7 percent. The industrial index will be down because the oil drilling rig count is down 51 percent and the agricultural commodities price index is only up 7 percent. On a quarter-to-quarter basis, the results look about the same. Employment is up 2 percent from the fourth quarter, based on data for January. The industrial index will be down with the oil rig count down 31 percent and the agricultural commodities price index up 5 percent. Sales and use tax collections are down 5 percent from the fourth quarter. All changes refer to seasonally adjusted data.

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WYOMING COINCIDENT INDICATORS INDEX: JANUARY 1974 - DECEMBER 1988

APRIL 26, 1989



SHADED AREAS REPRESENT U.S. RECESSIONARY PERIODS.

FEATURE ARTICLES

UW and Economic Development in Wyoming

Universities across the country are playing increasing roles in state economic development. Forty-six states, including Wyoming, support nearly 300 special programs to stimulate technological innovation and new product development. Expenditures by these programs will top \$400 million nationwide in 1989 with universities receiving the lion's share of funding.

States have tried to stimulate technological innovations with commercial potential because of the vast promise offered in biotechnology, robotics, computing, materials science, energy and many other fields. Universities have become involved because they do research and train students in these areas. In fact, universities do a surprisingly large fraction of the technology-oriented research currently conducted in the U.S.

The past 25 years have seen the emergence of high quality research programs at the University of Wyoming. UW now ranks in the top 100 research universities in the U.S. and brings in about \$22.4 million annually in contracts and grants, mainly from federal and industrial sources.

These programs, both directly and indirectly, contribute to technological advancement and can assist Wyoming in reversing its current economic slump. This article offers an overview of the economic development problems that Wyoming faces and identifies what UW can contribute toward solutions.

"Economic development" is used so frequently and in so many contexts that its meaning can be hazy. The basic idea is really quite simple, even if it later proves difficult to implement. "Economic development" is a cooperative effort between government and industry to permanently expand the economic base of a state or a community.

Cooperation is needed because, in Wyoming, economic development is not just the concern of the Economic Development and Stabilization Board, the Travel and Recreation Commissions, UW, or an industry like the power companies. It is a concern of the entire State. Interests shared in common must be identified and joint action must be taken to prevent divergent efforts from cancelling each other out.

Permanent expansion of the economic base is underscored to make the overall objective clear. True economic development is concerned with enlarging job opportunities. These opportunities must endure over the long term, otherwise not much has been accomplished. Expansion of the economic base is analyzed by considering the United States as a whole, before turning attention to Wyoming.

Nationally, increases in productivity (sometimes called improvements in technology or technological progress) have been and will continue to be responsible for rising per capita

income and an improved standard of living. Productivity can be measured in per work-hour terms and refers to the quantity of goods and services produced per unit of labor input.

During 1870-1979, labor productivity grew by an astonishing factor of 11. That is, at the end of this 110-year period and after adjusting for population growth, the amount of output from the U.S. economy to be divided among U.S. workers was 11 times larger than at the beginning. It may have taken 110 years, but this is the ultimate in economic development. Productivity growth has several sources. For example, more equipment may be added to a production process. A four person ditch-digging crew, for example, can move more dirt in a given period of time with four shovels than with two.

However, productivity gains enjoyed by the United States reflect a broader range of causes than simply adding more equipment of the type already in use. In many industrial situations, better education and training of workers can lead to greater efficiency and thus increased output per worker-hour even when quantity and quality of equipment does not change. Also, improvements in old equipment and the development of new equipment represent important sources of worker productivity gains.

The development of modern computing equipment is a dramatic example of this technological progress, but the list of significant equipment improvements that have occurred over the past century is long indeed. In fact, better trained workers, combined with improved equipment, have radically altered U.S. output.

Nevertheless, a worrisome recent development is that U.S. productivity growth appears to be slowing down. This trend, coupled with rising growth rates of output per worker-hour in Pacific Rim and European countries, suggests to some that the U.S. is "deindustrializing" and is losing its prime manufacturing jobs to overseas competitors.

Articles describing the deindustrialization process have appeared in such publications as *Time* and *Newsweek*. Not all descriptions are the same, of course, but most express the grim view that the United States just doesn't have the tenacity to compete anymore.

Furthermore, unless the fire is rekindled, U.S. labor ultimately will be forced into heavy unemployment or low paying service sector jobs.

There is no question that U.S. productivity growth has moderated; but a closer look at the facts suggest that the deindustrialization story breaks down quickly. As William Baumol argues in his recent article titled "Is There a U.S. Productivity Crisis" in the February 3, 1989 issue of *Science*, if other countries really are stealing U.S. industrial jobs, then their identity should be obvious. Japan and West Germany are prime suspects. Yet, between 1965-

1980, these countries increased the share of their labor force in service production by 31 percent and 19 percent, respectively.

The United States during that time increased its share of labor force in service production by 10 percent, a smaller percentage than for any other developed country except New Zealand. Also, between 1962-1984, the U.S. share of total industrial employment in the world's 24 most industrialized countries actually rose by about 20 percent. Finally, productivity growth has been slowing down worldwide as well as in the United States, so the gloom and doom of deindustrialization may not be inevitable after all.

Maintaining world industrial leadership into the 21st century will not be easy for the United States to accomplish. With a "borderless" Europe scheduled for 1992 and rapid economic growth in the Pacific Rim, international competition will only intensify.

This prospect points to the need for national policy aimed at stimulating productivity growth. Such a policy has yet to be completed, but four ingredients are essential. They are: (1) more inventions and innovations that can be commercialized, (2) higher success rates of entrepreneurs and small businesses, (3) better education and training of the U.S. work force and (4) larger amounts of improved equipment available for workers to use.

All four of these ingredients are important to increasing labor productivity, but the last one may be the most important of all. According to a recently released statistical study by Jorgenson, Gallop and Fraumeni titled Productivity and U.S. Economic Growth improvements in the quantity and quality of industrial equipment (or capital stock as it is sometimes called) accounts for about 50 percent of U.S. productivity gains in the last century.

These four ingredients also indicate that areas where Wyoming should focus its economic development efforts. Economic development in Wyoming (or any other state for that matter) consists of increasing the productivity of those who live here. If there are more goods and services to go around, Wyoming residents will enjoy an improved standard of living.

A state, however, has greater latitude in seeking productivity gains for its residents than does the nation as a whole. This happens because both investment funds and people move more easily between states than they can between countries.

Consequently, well-conceived programs that encourage industrial relocation can make a great deal of sense from a state's perspective. If successful, industrial relocation programs are the quickest means for a state to increase its plant and equipment base.

Wyoming would do well to continue refining its efforts in this area, particularly because this state is relatively unknown in the industrial relocation arena. Marketing and promotion efforts may have a big payoff.

The Economic Development and Stabilization Board (EDSB) is in the beginning stages of a campaign to attract firms from the plastics, computer and other light industries to Wyoming by using advertisements placed in carefully chosen trade publications. This campaign has generated over 400 inquiries to EDSB in the first four weeks. This volume is 10 times ahead of the number of inquiries received before the campaign.

Tourism promotion can have a major impact, too. Communities have improved their economic base as people from other States take advantage of Wyoming's vast recreational opportunities.

Wyoming has additional programs aimed at other ingredients of increased productivity. For example, through the community colleges, the Small Business Development Center Network provides a broad range of consulting services aimed at improving business skills of Wyoming entrepreneurs. The EDSB complements these services by offering assistance to Wyoming businesses in selling to the federal government as well as technical assistance to community economic development organizations.

The Department of Labor administers programs aimed at upgrading job skills of the state's work force. Wyoming's primary, secondary and higher educational institutions offer more general training that enhances productivity, but which usually is not aimed at particular job situations.

The Science, Technology and Energy Authority (STEA) can now support research into new technologies that can be commercialized in Wyoming. In early March 1989, Governor Mike Sullivan approved the State Legislature's appropriation of \$500,000 to STEA. This appropriation can be used to make applied research grants subject to dollar-for-dollar matching funds from non-state governmental sources.

This large number of players in the economic development arena makes a partnership philosophy imperative. Objectives of one organization cannot be pursued in a vacuum when economic development is a concern of the whole state. As stressed in the Wyoming Economic Development Plan, recently released by EDSB, cooperation and coordination are important.

Economic development leadership is provided by the EDSB, headed by Governor Sullivan. There are many state and community programs that are critical to the overall effort.

UW makes a unique contribution because it is the only baccalaureate and graduate degree granting university in Wyoming. UW is Wyoming's higher education cornerstone, not only in teaching, but also in related research and technical assistance. Higher Education contributes to economic development in Wyoming, particularly when integrated with efforts of other organizations.

Wyoming's young people need to be grounded in scientific, agricultural, engineering, and commercial subjects. Otherwise, the entire state will be left behind. University research is an integral part of the education process.

Just as students can't learn what they haven't been taught, instructors can't teach what they don't know.

Participating in research represents strong encouragement from faculty to stay on top of new developments in their fields and thus be in a position to communicate this information to students both in and out of the classroom. Maintaining an active research program forces faculty members to carefully think through and apply their ideas, a process that frequently makes them better able to communicate ideas to others.

In addition to support of teaching programs, University research can directly assist state economic development efforts in closely related ways. Leading scientific research centers are an automatic drawing card for firms that rely either on keeping abreast of the latest technological developments or on having access to top scientific and engineering talent.

Many people know about examples like Stanford University and the Silicon Valley, the universities in Pennsylvania and the Ben Franklin Partnership, Massachusetts Institute of Technology and Route 128 corridor, and the Research Triangle in North Carolina which has grown up around Duke University, University of North Carolina, and North Carolina State University.

Other research centers have led to job creation and increases in labor productivity in neighboring states such as Utah, comparatively poor states like Arkansas, and oil patch states like Oklahoma and Texas.

Wyoming is having its share of success in this area. One company, Advanced Technology of Wyoming has located in Laramie to develop and produce parts of buses, using composite materials. The company also anticipates opening a Cheyenne operation to assemble buses.

Faculty in the College of Engineering are developing a unique diesel-electric drive designed to reduce pollution and increase efficiency. An out-of-state company is considering relocating to Wyoming in order to be closer to that expertise. Also, UW soon will reach an agreement with a California biotechnology company based on joint research and product development of a completely new form of herbicide.

In addition to attracting businesses, research centers also spin-off ideas that can lead to new business formation. In his study, David Birch found that between 1967-72, small business was responsible for over three-fourths of net new job creations. This figure was called into question by later studies and even by Birch; however, the overwhelmingly positive contribution of technology and small business development to productivity gains and employment growth is not in dispute. At a conference held earlier this year in Casper, sponsored by EDSB and the Wyoming Economic Development Association, Jack Weimer of the Midwest Research Institute, predicted that by the year 2000, a large share of all U.S. private sector jobs will be in companies that do not exist today.

Fortunately, UW is in a strong position to assist as Wyoming attempts to build a stronger economy. Over the past 25 years, a number of high quality research programs have emerged with support from the state legislature, the federal government and private industry. The Enhanced Oil Recovery Institute and the Composite Materials Research Group are two of many examples that can be cited.

Additionally, more areas of research strength now are being built through special programs such as the Wyoming Experimental Program to Stimulate Competitive Research (EPSCoR) and the UW Applied Research and Economic Development and Diversification Programs.

EPSCoR began in late 1986 as a \$6 million, five year program to elevate the stature of 10 UW research programs. Half of the support comes from the National Science Foundation, one quarter comes from a \$1.5 million appropriation from the State Legislature and the remainder comes from internal sources.

Programs receiving support include chemistry, fossil energy sciences, molecular biology, scientific computation and high plains anthropology. The main idea behind this program is to develop centers of excellence on the UW campus that can successfully compete for research funding from federal agencies, industry, and private foundations. Centers were selected partly by identifying natural research opportunities that are unique to Wyoming.

The Economic Development and Diversification Research and Applied Research programs were built on the EPSCoR initiative with enhancement of the Wyoming economy in mind. Over the period 1987-88, the former program supported numerous projects concerning coal drying processes, enhancement of the outfitting industry, pricing strategies for Wyoming lean beef, Wyoming's business corporation act and blue sky laws and further development of opportunities for tourism.

In fall 1988 work began on another set of projects through the UW Applied Research Program supported by \$900,000 appropriation from the Wyoming State Legislature for the 1989 biennium. Some of these projects are aimed at identifying improved exploration methods for oil and gas reservoirs, determining the feasibility of methane production from Wyoming coal, developing sugar beet plants that are genetically resistant to curly top virus and developing a biological preservative to extend the shelf-life of vacuum packaged refrigerated beef.

More detailed coverage of these and other UW programs that contribute to Wyoming economic development efforts will be provided in a series of articles appearing in the Casper Star-Tribune. This series, which is sponsored by Pacific Power and Light, began on Sunday, June 4 and will appear biweekly over the coming year.

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Coordination and Planning*

Opportunities in Wyoming for Economic Development and Potential for Production Agriculture¹

INTRODUCTION

The principal objective of this report is to present information on opportunities for increasing production and thereby creating added value in production agriculture. The steps involved are a description of the resource base, identification of problems and underutilized resources and suggested opportunities and solutions.

Problems in Wyoming's economy are many and known at the present time. Economic revival in the minerals industry and higher productivity or prices for agricultural products over several years would be very beneficial.

At the risk of oversimplification, new dollars generated by basic production activities are primary income. For instance, primary income includes receipts from sales of agricultural and timber products produced in the state and exported. The minerals industry and tourism also create primary income, primarily from wages and salaries paid to Wyoming residents.

Secondary income is represented by transactions within the state as primary income is spent, and creates economic activity or employment opportunities. The state's retail and service sectors are largely secondary economic activity.

Generation of additional primary income is a key element in Wyoming's economic development.

Alternative Ways of Increasing Agriculture's Primary Income

At least three alternatives exist for increasing primary income in agriculture. First, an increase in market price would do so, but market prices are not controlled or significantly influenced by Wyoming producers.

A second way to increase primary income is by increasing value through changing the form of the product marketed to obtain a higher price--the so-called "value-added" activities.

With or without higher prices or value added activities, primary income in Wyoming's agricultural sector can be increased by greater

aggregate production, which is the thrust of this report.

Competitive Agricultural Markets

Often, suggestions to increase agricultural output are met with the objection that if quantity produced increases then the price received will decrease. One must distinguish between the price/quantity relationship from the standpoint of an individual producer or a small entity and that relationship from the standpoint of all producers.

Among characteristics of a competitive market, as the term is used in economics, are:

1. a large number of sellers and buyers, and,
2. any one individual in the market does not produce or sell in quantities sufficient to have a significant impact on price.

These two characteristics describe in part the market structure for most agricultural commodities.

From the standpoint of an individual producer in a purely competitive market, price is constant regardless of quantity sold.

Considering all producers and markets in the United States, as volume of production is increased the price at which it can all be sold is reduced. However, the state of Wyoming represents a small part of the national production for most agricultural products. As a result, it could be argued that the entire state production of most products could be doubled, if possible, with essentially no impact on national prices.

Obviously, there are some imperfections in local markets where increased production results in price impacts. A prime example in Wyoming is the production of hay. Transportation costs are such that increased production within any particular geographic area is likely to be accompanied by reduced prices for hay in that area.

Recognizing there are exceptions, most arguments against increased volume of

¹This report has been extracted from a Wyoming Agricultural Experiment Station draft publication of the same title. An earlier publication on this subject, "Opportunities for Economic Development and Potential for Value-Added in Wyoming Production Agriculture," B-898.18, contains documentation and is available from the Wyoming College of Agriculture, or through local Cooperative Extension Service offices.

agricultural production in Wyoming, based on adverse impacts on prices, are fallacious. Therefore, increasing the volume of Wyoming's agricultural production will result in an increase in primary income generated by the agricultural sector.

LAND RESOURCES

Wyoming's land resources are summarized below:

<u>Land Ownership</u>	<u>1,000 Acres</u>	<u>Percent of Total</u>
Privately owned	25,951	41.46
State and local	<u>4,276</u>	<u>6.83</u>
Sub-total	30,227	48.29
Indian Reservation	1,640	2.62
Sub-total	31,867	50.91
Federal, used in Agriculture		
Bureau of Land Management	18,417	29.42
U.S. Forest Service	<u>9,254</u>	<u>14.78</u>
Sub-total of Federal	27,671	44.20
Total Above	59,538	95.11
Other Federal lands (Little or no use in agriculture)	3,059	4.89
Total Federal Land	30,731	49.09
Total Land	62,073	99.16
Inland Water	525	0.84
Total Area	62,598	100.00

About 2.3 to 2.4 million acres, or about 9 percent of the privately owned land is harvestable cropland. Most of the other privately owned and state lands are grazable.

A significant part of the National Forest land is ungrazable, for various reasons. There is very little agricultural use of the "Other Federal lands", which is primarily National Parks, Fish and Wild Life Service or Bureau of Reclamation, in the tabulation above.

Grazable acreage, including private, Federal and Indian Reservation lands, probably amounts to 50 to 53 million acres, after allowing for ungrazed or ungrazable areas of these lands.

Grazing reports indicate the animal-unit-month (AUMs) of grazing available on federal lands for 1980-87 and 1987 as follows:

<u>Agency</u>	<u>1,000 AUMs</u>	
	<u>1987</u>	<u>1980-87</u>
U.S. Bureau of Land Management	1,737	1,633
U.S. Forest Service	<u>710</u>	<u>611</u>
Total Federal	2,447	2,244

An AUM or AM is defined by Federal agencies as use by one head of cattle, or five sheep for one month. Animals under six months old are not counted or charged for by federal agencies.

In addition to actual use above, data available on non-use for 1981-84 are summarized below:

<u>Agency</u>	<u>1,000 AUMs</u>	
	<u>Active Use</u>	<u>Authorized Non-Use</u>
Bureau of Land Management	1,681	370
U.S. Forest Service	<u>684</u>	<u>114</u>
Total BLM and Forest	2,365	484

The authorized non-use includes some acres idled because of ownership changes or for range improvements or agency administrative reasons. Some of it represents idle capacity which could perhaps be brought into use.

CASH RECEIPTS AND VALUE OF PRODUCTION

Cash receipts and value of production for 1987 and 1980-87 are summarized in Table 3. Data for 1987 show the most recent information fully available. The 1980-87 averages give a better picture of longer-term relationships.

The differences between cash receipts and value of production for crops are largely accounted for by use of feed crops on farms and ranches where produced. Value of production and cash receipts for livestock differ because of changes in inventories, resale of purchased livestock and home consumption.

The fact that about 80 percent of cash receipts is from livestock is cited to illustrate the importance of livestock in Wyoming's agricultural sector.

When value of production is used, livestock accounted for about 56 percent of the total and harvested crops accounted for 44 percent. At least \$148 million of crop production, the difference between value of production and cash receipts, is fed to livestock on farms and ranches.

CROP PRODUCTION

Crop production in Wyoming for 1980-87 is summarized in Table 4.

Hay

Alfalfa and other hay are the most important crops in terms of irrigated and total acreage. Combined, they also account for about 48 percent of total crop value. Because of its extensive on-farm use, hay is only the second most important cash crop. Even then, most of the cash receipts are from inter-farm sales for final use within the state. Increased production and developing out-of-state markets for hay would contribute to primary income.

Other Crops

Sugar beets is the most important cash crop grown in Wyoming. It also produces a significant amount of grazing on beet tops, but a general practice is to "flail" the tops,

shredding them and leaving little grazing value. The value of tops, if treated to allow grazing, would be about \$80-\$90 per acre.

Wheat, produced mostly on dry land, is an important cash crop, and allowing for summer-fallowed land (non-planted) equal to planted acres, dryland wheat uses more acreage than any other crop.

Barley for feed and malting, corn, either for grain or silage, and dry beans are other important crops either for cash sale or feeding.

Total AUM Equivalents

Based on livestock inventories, crop production and other information, indicated

total AUM equivalent of production in 1980-87 and 1987 are summarized below:

<u>Indicated AUMs (Thousands)</u>		
<u>Item</u>	<u>1980-87</u>	<u>1987</u>
Hay	6,726	7,028
Corn silage	746	779
Aftermath	1,300	1,300
Federal rangelands	2,447	2,244
Other rangelands (residual)	7,673	6,625
Total production	18,992	17,976

Hay and corn silage AUM equivalents are calculated based on 3.167 AUM equivalent per

Table 3: Value of Production and Cash Receipts by Commodities, Wyoming, 1987, and 1980-87 Averages (\$1,000)

<u>Commodity</u>	<u>Value of Production</u>		<u>Cash Receipts</u>		<u>1980-87 Percent</u>	
	<u>1987</u>	<u>1980-87 Average</u>	<u>1987</u>	<u>1980-87 Average</u>	<u>Value of Prod.</u>	<u>Cash Receipts</u>
<u>Livestock and products</u>						
Cattle and calves	\$314,511	\$288,820	\$464,264	\$416,098	47.06	69.50
Sheep and lambs	30,843	22,896	30,236	26,233	3.73	4.38
Wool	8,094	8,021	8,094	7,909	1.31	1.32
Milk	14,040	16,802	13,338	16,089	2.74	2.69
Hogs	5,126	4,877	5,839	4,968	0.79	0.83
Chickens	a	12 ^a	2	8	0.00 ^b	0.00 ^b
Eggs	247	371	247	316	0.06	0.05
Honey	1,530	1,507 ^a	1,530	332 ^c	0.25	0.06
Other livestock	-----	-----	4,846	5,136 ^c	-.--	0.86
Total livestock and products	\$374,391	\$343,306	\$528,396	\$477,089	55.94	79.69
<u>Crops</u>						
All hay	\$106,512	\$128,552	\$ 24,872	\$ 25,943	20.95	4.33
Sugar beets	44,291	35,066	36,600	34,091	5.71	5.69
Barley	31,909	30,985	14,812	14,121	5.05	2.36
All wheat	22,028	25,328	19,782	25,547	4.13	4.27
Corn silage	12,968 ^d	16,023 ^d	-----	-----	2.61	-.--
Corn for grain	10,956	13,630	4,576	4,540	2.22	0.76
Dry beans	9,044	11,831	7,111	10,688	1.93	1.79
Potatoes	2,125	4,511	2,131	3,609	0.74	0.60
Oats	3,528	4,432	1,691	1,481	0.72	0.25
Other crops	-----	-----	2,025	1,580	-.--	0.26
Total crops	\$243,361	\$270,358	\$113,600	\$121,600	44.06	20.31
All commodities	\$617,752	\$613,664	\$641,996	\$598,689	100.00	100.00

Source: "Wyoming Agricultural Statistics", 1987-88, Wyoming Crop and Livestock Reporting Service, Statistical Reporting Service, U.S. Department of Agriculture, cooperating with the Wyoming Department of Agriculture and the Department of Agricultural Economics, College of Agriculture, University of Wyoming. Data for 1987 crops are from same source, Bi-Weekly Report, 31 January 1989.

^aNo estimates available for 1986 and 1987 for chickens or for 1982-85 for honey. 1980-87 averages assume non-reported years of chickens and honey are equal to average of reported years.

^bLess than 0.005 percent.

^cData not reported for 1980-85. Honey is presumably included with other livestock during those years, and is undoubtedly about the same as value of production each year, as it was in 1986 and 1987--the two years reported, but averaged over eight years to get correct totals. Data for 1986 and 1987 would be more indicative of average.

^dValue of production of corn silage is not reported by the source, but is calculated by multiplying production by 33 percent of the price of all hay in November.

Table A:

Crop Production in Wyoming, 1980-87 Averages

Crop	Planted Acres ^a	Harvested Acres			Yield Per Acre			Production		
		Irrig.	Non-Irrig.	Total ^a	Irrig.	Non-Irrig.	Total	Irrig.	Non-Irrig.	Total
					Bushels			Bushels		
All wheat	330,250	15,275	268,350	283,625	47.2	27.8	28.8	738,725	7,475,525	8,214,250
Winter wheat	305,625	8,988	254,762	263,750	46.8	28.2	28.9	427,750	7,207,875	7,635,625
Spring wheat	24,625	6,287	13,588	19,875	47.1	19.1	28.0	310,975	267,650	578,625
Oats	89,250	29,875	25,125	55,000	63.8	28.9	48.0	1,904,725	738,525	2,643,250
Barley	158,750	123,212	25,663	148,875	73.8	32.0	66.5	9,090,513	811,363	9,901,875
Corn for grain	98,000 ^b	51,125	250	51,375	105.2	36.8	104.9	5,377,175	9,200	5,386,375
					Tons			Tons		
Corn for silage	^b	43,125	--	43,125	17.40	--	17.40	746,000	--	746,000
Sugar beets	43,925	43,338	--	43,338	12.10	--	21.10	918,250	--	918,250
All hay	1,187,125 ^c	910,737	276,388	1,187,125	2.03	0.99	1.79	1,847,513	276,113	2,123,625
Alfalfa	530,000 ^c	396,750	133,250	530,000	2.82	1.12	2.39	1,119,869	153,006	1,272,875
Other hay	657,125 ^c	513,987	143,138	657,125	1.41	0.86	1.29	727,644	123,331	851,000
					Cwt.			Cwt.		
Dry beans	35,500	34,375	--	34,375	19.2	--	19.2	666,875	--	666,875
Total Acres	2,300,000 ^d	1,251,062	595,776	1,846,838						

Source: "Wyoming Agricultural Statistics", 1987-88, Wyoming Crop and Livestock Reporting Service, Statistical Reporting Service, U.S. Department of Agriculture, cooperating with the Wyoming Department of Agriculture and the Department of Agricultural Economics, College of Agriculture, University of Wyoming.

^aThe difference between acres planted and harvested are accounted for by crop failure, and wheat and barley and oats harvested for hay.

^bPlanted acres of corn includes that harvested for grain, 42,400 for silage, around 2,000 acres grazed as forage, and about 2,000 acres "crop failure."

^cUses harvested acreage to represent planted acreage, which is not reported for hay crops.

^dAlso includes about 330,000 additional non-planted acres to allow for summer fallowed land in a crop-fallow program on non-irrigated wheat land.

ton of hay and 1.0 AUM equivalent per ton of silage.

Allowing for about 1.0 AUM of aftermath per acre of irrigated hay and significant aftermath production following corn-for-grain and sugar beets and lesser production from other crops, total aftermath production from croplands is probably in the range of 1.2 to 1.5 million AUM's.

This suggests 7.7 million AUMs are available from private, state and Indian rangelands for 1980-87, indicating about 4.0 acres per AUM carrying capacity which is very plausible.

Cropland and aftermath probably produces more total AUM's than does state and privately owned rangelands and 3.5 to 4.0 times more than does federal rangelands. The federal rangelands have importance exceeding that indicated because they fill out seasonal forage needs for many producers.

CATTLE

Estimated inventories of cattle in Wyoming for 1987 and the 1980-87 average, are summarized in Table 5.

Table 5: Cattle Inventories, Calves Born, In-shipment, Death Losses and Animal-Unit-Months in Wyoming, January 1, 1980-87 and 1987 (thousands)

Item	1980-87 Averages	1987
Cows that have calved	665	660
Replacement heifers over 500 lb.	125	115
Potential calving herd ^a	790	775
Other cattle over 500 lb. ^b		
Heifers	71	89
Steers	129	137
Sub-total other cattle	200	226
Calves under 500 lb.	338	261
Bulls	40	38
All Cattle and calves	1,368	1,300
Calves born	648	620
In-shippments	352	390
Calf death loss	41	35
Cattle death loss	23	20
AUMs required	16,516	16,088
Cattle on feed	77	70

Source: Same as Table 3.

^aOverstates the actual calving herd because about 27,000 cows will be sold out-of-state before calving and some replacement heifers are not intended to calve in the year.

^bIncludes cattle on feed.

The average calf crop born is 97.4 percent, based on cows and heifers that have calved at some time (i.e., 648,000 divided by 665,000). However, the average calf crop born is only 85 percent based on January 1 inventories of cows that had calved, minus out-shipments before calving and plus all replacement heifers that apparently calved and entered that class during the year (i.e., 648,000 divided by 763,000). Allowing for death loss from calving to weaning, the average calf crop weaned is only about 80 percent.

In addition to cattle on hand, a large and gradually increasing number of cattle are shipped into the state each year. These are mostly calves or yearlings that have originated out of state and are brought to Wyoming for the grazing season to add cheap gains on range before going on to feedlots. Combining 352,000 in-shipments, 338,000 calves under 500 lb. and 200,000 "other cattle" over 500 lb. amounts to 890,000 total animals, or 100,000 more than the "potential calving herd".

Value of production and cash receipts from cattle and calves in Wyoming for the 1980-87 period and for 1987 were shown in Table 3. Quantity marketed and cash receipts exceed quantity produced and value of production. Resale of the purchase weight of cattle and inventory liquidation also adds to cash receipts, but not to value of production.

Shipments of Wyoming cattle to out-of-state destinations are greatest in September and October for steers and heifers, October and November for calves and cull bulis, and October-December for cull cows.

For 1980-87, steers and heifers accounted for about 66 percent of total out-of-state movement and calves about 17 percent. The steer and heifer shipments, 718,909 head, includes many cattle brought to Wyoming in the spring of the year and shipped out in the fall, as well as calves retained and grown to yearling age.

SHEEP

Sheep inventories are summarized in Table 6. "Lambs saved" to docking represents 91 percent lamb crop for 1980-87, which includes a low of 73 percent in 1984. Death losses of sheep and lambs cause significant economic problems. About 6.2 percent death loss for sheep was shown for 1980-87. Death loss in lambs averages about 9 percent of "lambs saved".

Cash receipts and value of production from sheep, lambs and wool were summarized in Table 3.

Movement of lambs and ewes is concentrated in September-November, when 65 percent of the lamb and 55 percent of the ewe movement occurs. There is also a rather steady movement of fed lambs from December-April when about 27 percent of the movement occurs.

Table 6: Sheep and Lamb Inventories, Death Losses, Wool Production and Animal-Unit-Months Required by Sheep in Wyoming, January 1, 1975, 1980-87 and 1987 (1,000 head)

Item	1980-87 Averages	1987
	(1,000)	(1,000)
<u>Stock sheep and lambs</u>		
Ewes-one year or older	673	530
Ewe lambs	161	119
Wether and ram lambs	16	19
Rams and wethers	26	22
Sub-total	876	690
 Sheep and lambs on feed	111	85
All sheep and lambs	987	775
 Lambs "saved" in year	609	515
Lambs saved per 100 ewes	91	97
Death losses		
Sheep	61	25
Lambs ^a	55	34
 Wool production		
Sheep shorn	965	810
Wool produced (1,000 lb.)	9.322	7.709
Fleece weight (lb.)	9.7	9.5
 AUM's required ^b	2.376	1.888

Source: Same as Table 3.

^aAfter docking.

^bBased on coefficient of .2 for all stock sheep and lambs multiplied by 12 months; .09 multiplied by 5 months for lambs "saved"; sheep and lambs on feed not counted.

APPLICATION OF ECONOMIC REASONING

The State as an Economic Entity

From the standpoint of economic development and agriculture in Wyoming, state agencies concerned and the University of Wyoming's College of Agriculture can view the state as a multiple-product firm. In that context, problems are identified and measured in terms of performance departures from targets or goals in the various product lines. Opportunities are defined in terms of possibilities of making changes in production or marketing to approach target achievement, and the aggregate impact such changes could produce.

Largest net gain will likely be realized from increasing production of one product if it can be done by use of underutilized fixed factors rather than by diversion of factors from one use to the other. An example is use of understocked rangeland by increasing the size of livestock herds. Another example is double cropping with some "alternate" crop following barley, and using seasonally idle resources.

Costs associated with fixed resources are, by definition, fixed costs. However, if a fixed resource is being used, the cost for use of that resource in a different use is the "opportunity cost", or the income foregone in the present use when the use is changed. If the fixed resource is idle then putting that resource to use is done without any concern for opportunity cost, which is zero for the idle resource.

The Importance of Time as a Factor

Given the sense of urgency created by present economic problems, time is also a very important element in the economic decision processes. Agricultural producers often ask for immediate results, and current economic conditions cry out for them.

Certain actions may produce immediate results and others may produce results only in the far-distant future. Examples of actions that have potential for producing results in the fairly immediate future include:

1. change in annual cropping or in management practices on annual or perennial crops, especially fertility, on crops such as alfalfa;
2. planting "alternative" crops, if their production and marketing is well researched, and significant marketing channel or processing facility development is not required;
3. change in feeding programs and/or marketing times for livestock, particularly calves and yearlings, but possibly lambs, also;
4. retention of more calves for sale as yearlings, to achieve better utilization of understocked rangelands and other underused forage resources; and
5. retention of more bred heifers and ewes for breeding herd expansion, for the same reasons state above;

Numerous examples of actions with more extended delays or periods for development could be given, but just two are:

1. "alternative" crops for which marketing channels and/or processing facilities must also be developed; and
2. meadow or range improvement practices, which require several years of cultural practices with delays in forage response followed by additional lags in livestock response and/or inventory adjustments to achieve full results.

It will be important to consider time and to give precedence to activities producing early responses.

The Total System

Wyoming agriculture is an interrelated system of rangeland, cropland and livestock. Changes in any part will induce changes or be accompanied by changes in the other parts.

UNDERUTILIZED RESOURCES AND OPPORTUNITIES - RANGELANDS AND CROPLANDS

Based on livestock inventories, it was concluded that total AUM equivalents required for all cattle, sheep and lambs were as follows:

<u>Year</u>	<u>Requirement, Thousand AUMs</u>
1975	22,797
1980-87	18,892
1987	17,976

Ranges may have been overstocked to some extent and harvested feed fully utilized in 1975. However, these data indicate a greatly reduced use of these resources at present. The extent of understocking may plausibly be 2.0 to 4.0 million AUM equivalents, allowing for the possibility of overstocking in 1975. Part of the reduced use may be of feed crops and crop aftermath, but there is probably a significant understocking of rangelands, also.

Authorized non-use of federal rangeland averaged about 483,000 AUMs for 1980-84, and was probably greater than that in 1987. Some amount of non-use is normal.

Assuming that the grazing resource is underutilized, one might expect some advantages in bringing these resources into use. Some ideas will be developed in discussing livestock as a resource and opportunity for using these other resources.

Alfalfa and Other Hay

Alfalfa yields seem to be generally below goals easily attainable with good management practices. That is particularly true of alfalfa hay on irrigated land. Minor improvements in yield could make major changes in total production and value because acreages are so great. For instance, a 10 percent change in state-wide irrigated alfalfa yield, 0.282 tons per acre (Table 4) would produce about 112,000 tons of hay and about \$7.5 million additional value at recent average fall prices.

Improvements in alfalfa yields may come from better management practices such as irrigation, fertility, insect control and timely harvesting, resulting in more tonnage and/or higher quality hay. Such changes could produce almost immediate results.

Over the long term, increased yields could result from variety selection for disease resistance and shortening the rotation of alfalfa. The immediate effect may be reduced alfalfa production, offset by higher production of other crops, primarily corn silage or feed grains. The longer term effect should be significantly increased alfalfa yields and production.

A number of advantages exist in producing alfalfa hay where biologically possible. Higher yields per acre reduce costs per ton of hay as compared with native hay. Where two or more cuttings are produced, the harvesting machine and labor requirements for harvesting can be distributed over a longer time period and a larger tonnage.

Alfalfa is also advantageous from the standpoint of nutritional quality.

Improvement of irrigated "other hay" is often, but not always possible. Use of fertilizer is often advantageous. In some cases

commercial fertilizer is often economical. In some cases "meadow hay" land may be converted to alfalfa. In other cases, species which are not responsive to fertilizer, i.e., sedges and rushes, may be replaced by species such as Regar Bromegrass or Meadow Foxtail which are responsive to improved water control, fertilizer and other management practices.

There is undoubtedly potential for improving the aggregate production of irrigated "other hay". However, the associated costs cannot be ignored and in some cases become prohibitive, because of the nature of the resources, e.g., climate, soils, drainage, topography, etc. Time is also an important element in meadow improvements and progress is often slow.

Small Grains and Corn

Currently, there is probably limited opportunity for increasing total acreage or production of any of the dryland grain crops.

Technology used and yields are relatively good for irrigated barley. Possibilities for increasing production and marketing of malt barley should be explored. Barley also produces straw with significant feeding value, and it could perhaps be more fully utilized than at present.

Because of the short growing season and early planting date, the possibility of double cropping with a forage crop, i.e., Brassicas, following barley should be thoroughly explored. Double cropping has an advantage because the cost calculation does not require consideration of income foregone (opportunity cost) as in the case of substituting one crop for another.

Corn is an important irrigated crop for Wyoming with the combined value of production of grain and silage exceeding the value of wheat. As in the case of other crops, the technology used is good. Still, it is important to work on fertility, weed control and development and testing of new varieties.

In the better producing areas the combined effect of superior yields, heavier bushel weights and higher feeding values result in a feed value production advantage of corn of more than 50 percent over barley and 200 percent over oats. The average yield of corn silage, 17.4 tons at 30 percent dry matter, is equivalent to 5.6 tons of alfalfa at 90 percent dry matter. That is almost 50 percent better than the county average yields of irrigated alfalfa in the best producing counties and more than double the state average yields. There should be opportunities for substitution of some corn for other feed crops.

Sugar Beets and Dry Beans

Sugar beets and dry beans are also crops where technology used in Wyoming is comparable to the best used other places. Yields are at or near their potentials. There may be some opportunity for salvage of aftermath values, particularly sugar beet tops.

Alternative Crops

Improving productivity is one way to increase basic income. Development of alternative crops may be a second way. Examples of alternative crops include Canola (rape seed) and perhaps some other oil seed crops, dwarf corn, and some of the Brassicas, i.e., turnips and Tyfon for late fall grazing.

A number of points should be noted in connection with alternative crops. Often, the alternative crop is a replacement for a crop which is currently being produced. Consequently, there will be a net gain in primary income only to the extent that the alternative crop produces greater value than the existing crop. As a result, net differences may be rather marginal.

When considering alternative crops, it is important to consider the technology required. Alternative crops which use equipment and technology used for crops presently grown will likely have some cost advantage. If investment in new equipment and/or acquisition of new knowledge is required, then costs and possibilities of failure increase.

Crops which have the potential to be both a feed crop and a cash crop may also have advantages. Use of the crop for feed could proceed until such time as a "critical mass" is reached which would allow for efficient marketing. Alternatives that require development of processing facilities present serious challenges because it may be impossible to produce in sufficient volume to justify the processing, marketing and input industries required to be competitive.

The Brassica crops for fall grazing may have some advantage in that they may be applicable in double cropping following barley. Brassicas in this situation may be useful as a fall-early winter pasture crop for any of several different kinds of livestock, particularly lambs, calves, or yearling steers and heifers.

Preliminary results of experiment station research reported for turnips and Tyfon grown as a second crop and grazed by lambs are as follows:

Item	1986-87 Average	
	Turnips	Tyfon
Days grazed	39.50	34.50
Lamb days per acre	786	783
Average daily gain (lb.)	0.43	0.43
Gain per lamb (lb.)	16.98	14.84
Gain per acre (lb.)	334	336
Cost per lb. gain	\$0.18	\$0.18

Tyfon showed a slight advantage over turnips in 1986, but that was reversed in 1987, and the 1986-87 averages were almost identical. The crops produced an average of 880 lamb days per acre in 1986, but only 689 lamb days in 1987.

Further research is required on these and other alternative grazing crops, for use by lambs, ewes, calves and cattle.

Further research is also required for production and marketing aspects for alternative cash crops.

UNDERUTILIZED RESOURCES AND OPPORTUNITIES - LIVESTOCK

Livestock, either cattle or sheep may represent the largest underutilized resource in Wyoming at the present time.

Cull Cow Marketing Adjustments

Marketing of cull cows in August instead of November has potential. Because of seasonality of livestock gains and price movements, gross receipts may increase by \$50 to \$90 per cull cow by marketing dry cull cows early. An increase of as much as \$80 to \$110 per head may result from marketing wet cows early based on 1975-86 average prices and seasonal price relationships. If about 19,000 cows were marketed early, gross receipts could increase by \$1.5 million.

Advantages in earlier marketing include:

1. a more even distribution of cash flow;
2. a slight reduction in interest expense or increase in interest income; and
3. the conservation of some of the feed resource.

Some management problems may be associated with earlier marketing of cull cows. These include:

1. providing pastures where potential culling prospects could be retained and gathered for early marketing;
2. slightly earlier than normal breeding and pregnancy testing if the prospects for culling may also have potential for retention;
3. early weaning of calves at perhaps 4-6 months of age, instead of 6-8 months if culling wet cows, with some increased cost and/or reduced weight of calves or yearlings.

An advantage of this type of program is that time is not an important consideration. It could be implemented very quickly and benefits realized at implementation. Increasing the volume marketed may have a depressant effect on prices as monthly volume on local markets would increase almost 100 percent. However, the effect would be relatively small on a regional basis, which is a key with a transportable product such as cull cows.

There may also be a potential for extending the cull cow marketing into January-March by a cow feeding program. That would require further economic evaluation. It would have a potential to provide a market for good quality alfalfa hay or other feeds such as corn silage. Carrying some cull cows these extra months could also lead to marketing more product (weight) at higher prices and extending the period of time when a raw material supply is available, and thereby perhaps enhance meat packing plant feasibility.

Some additional research is necessary to evaluate late fall-early winter pasturing and feeding programs, requirements, and rates of gain. The potential is sufficient to warrant that. As in the case of advancing the marketing

dates, time lags between initiation and completion are small.

Retention of Calves

Calves also represent a resource as well as a product. Movement of Wyoming calves to out-of-state locations averaged 188,000 during the 1980-87 period. About 150,000 of the movement is in October-December. If 100,000 of those 150,000 calves were retained in the state to long-yearling age they would provide:

1. the opportunity to use some of the state's range resource at a very low cost for land use;
2. about 350 lb. weight added per head, or 35 million lb.;
3. an increase in cash receipts and value of production of about \$20 million at 1984-88 prices;
4. an "economies of size" effect is produced as "fixed costs" of underutilized resources can be spread over greater output; and
5. the supply of cattle that can be available as inputs into a further growth (fall-winter pastures) or feedlot fattening stage is enhanced.

Requirements would be:

1. about 130,000 tons of high quality alfalfa hay;
2. about 375,000 AUM's of range and pasture lands;
3. about \$41 million in capital to carry the calf and feed inventories at 1984-88 prices;
4. about \$4 million in interest costs or interest income foregone on the \$41 million; and
5. about \$5 million non-feed and non-land costs, which is about \$5 per head per month.

As with cull cows, time lags are not an extremely important consideration. An action initiated in November can be completed 9-11 months later. To be sure, there are requirements for feed, range forage and capital. However, technology, buildings, equipment, labor force and marketing channels exist at present.

A \$20 million gain in cash receipts covers the cost of \$8 million for feed, \$5 million for non-feed costs and \$4 million for interest expense at 1984-88 prices and costs. Although there is no large profit, feed, labor, machinery, and interest costs are covered. In effect, those resources are marketed through the yearlings.

Increased Calf Gains

In addition to carrying a greater number of calves to yearling age, there is potential for achieving higher gains and heavier weights on all calves. Results of feeding programs to produce average daily gains of 0.9 lb. and 1.0 lb. to provide winter gains of 150 lb. and 165 lb. for steers and heifers, respectively have been evaluated. After allowing for compensatory gains in the summer, the projected sale weights compared with weights reported by a University of Wyoming study of above-average operators are shown below:

<u>Ranch Type</u>	<u>Sale Weights (lb.)</u>	
	<u>Steers</u>	<u>Heifers</u>
Small cow-yearling,		
weight reported	790	733
weight projected		
With "good feeding"	850	790
Gain from "good feeding"	60	57
Large cow-yearling,		
weight reported	763	644
weight projected		
With "good feeding"	825	775
Gain from "good feeding"	62	131

Gains in the 57-62 lb. range seem plausible for the "good feeding" program. The larger gain shown for yearling heifers relates back to the low sale weights reported. Although the gain is large, the ending sale weights are reasonable.

If weights are increased by 60 lb. per head at these heavy weights, there would be a slight price discount for the heavier weight. The increase in gross receipts is about \$36 per head at 1984-88 prices.

Previously, the idea of augmenting the 338,000 calves in the state by retention of an additional 100,000 head was mentioned, giving 438,000 total calves. Achieving heavier weights on about 75 percent of 438,000, or on 220,000 steers and 110,000 heifers would produce about \$12 million increase in gross returns.

Production and use of a greater amount of alfalfa hay in the feeding program could be very instrumental in achieving heavier weights. Purchasing some feed or moving calves to locations of surplus alfalfa production might be considered.

Unlike some of the other programs mentioned, these gains may be with little additional costs. The feed costs are mostly represented by a change from one type of feed to a higher quality feed producing higher average daily gains, with only a relatively small incremental quantity of feed and a slightly higher price. The investment in cattle and labor and machinery requirements would be about as at present. Time would not be a large factor. There would be a lag of 9-11 months from initiating better winter feeding programs to realization of benefits.

Sheep and Lambs

Data indicate 58 percent of Wyoming's lambs, averaging 252,000 head for 1980-87, are moved out of the state in September and October. Significant movements, averaging 133,000 lambs, occur from November through April. Most of the September-October movement is feeder lambs. Reports indicate 85,000-130,000 sheep and lambs on feed on January 1 during this decade. The November-April movement undoubtedly includes significant numbers of fat lambs, especially in January-April.

Given that it is difficult to increase lamb crops or reduce death losses in a short time frame, increased feeding may be the best way to increase production from the sector. Use of

late fall-early winter alternative crop pastures may be beneficial, and feasible in some cases.

If some part of the lamb movement in September-October could be carried an additional 265,000 lamb months we might project results as follows:

1. average gain of 0.4 lb. per day or 12 lb. per lamb month;
2. total gain for 265,000 lamb months of about 3.18 million lb.;
3. an additional value of about \$2.2 million;
4. a use for 4,500 acres of late fall-early winter alternative crop pastures; and
5. a use for the equivalent of 8,000 tons of high quality alfalfa hay, or other feeds, assuming about half the feed requirement from pasture and half from harvested feed.

CONCLUSIONS

The greatest opportunities for improvement in production agriculture and its contribution to the economy of Wyoming undoubtedly exist in

increasing output of products presently produced, rather than looking for "magic" in higher valued or "value-added" products. There is room for improvement in efficiency of production, particularly of hay crops and livestock.

There also appear to be underutilized resources, particularly rangeland and cropland forages that might be more fully utilized. Young livestock marketed out of state might also be viewed as an underutilized resource which could be exploited by further growth using forage resources in the state.

Well designed and practical research programs coupled with sound education programs can help bring about changes to foster economic development through production agriculture in Wyoming.

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**ECONOMIC
CHANGES**

ECONOMIC CHANGES

(Editor's note: The purpose of this section is to point out areas of Wyoming's economy in which noteworthy changes or trends developed during the latest reporting period.)

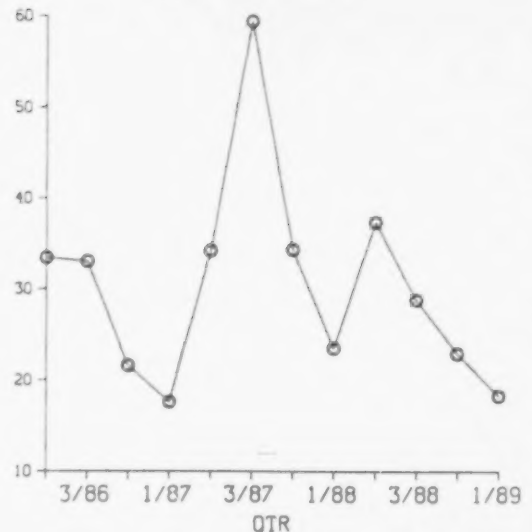
Presented in the Update for the first quarter of 1989 are trends in the number of new residential dwellings, the value of dwellings constructed, and the total mortgage loans in savings institutions and loans savings banks in Wyoming.

Comparing the first quarter of 1989 to the first quarter of 1988, the number of housekeeping dwellings under construction decreased 23 percent. The value of the construction decreased by 22 percent. Reflecting this decline, the value of mortgage loans decreased by \$25,252,000.

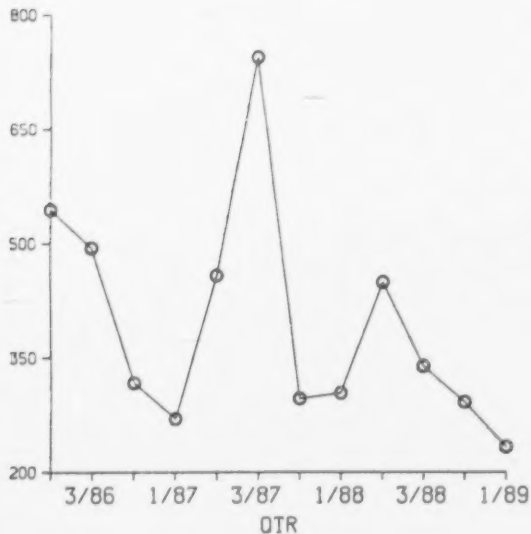
During this same period, the Wyoming labor force lost 2,500 workers and the unemployment rate changed from 8.2 percent to 7.7 percent.

Value of Residential Dwellings

Millions of Dollars

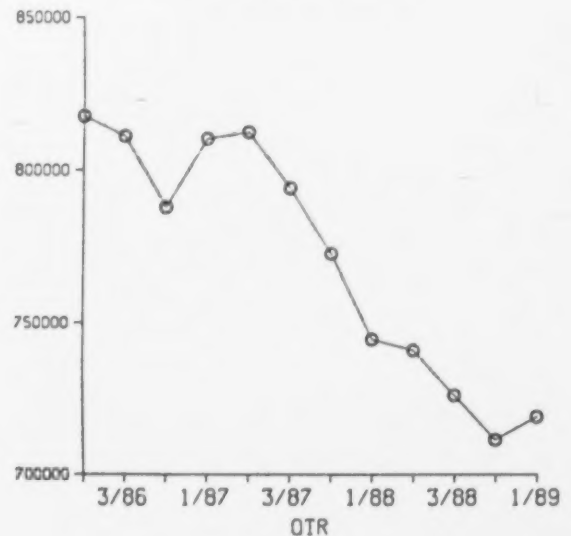


New Residential Dwellings



Mortgage Loans

Thousands of Dollars



**WYOMING
DATA**

Table 7: Agriculture¹

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. Timber Cut in Wyoming National Forests (MBF)	10067.	10867.	42510.	47783.	25572.	20299.	75482.	28080.	5860.	39416.	54863.	23488.
Price Indices ² (1967=100)												
2. Wyoming Crops, Prices Received-Latest	222.	216.	208.	204.	209.	229.	218.	218.	236.	319.	310.	336.
3. Wyoming Crops, Prices Received-Average	232.	219.	215.	206.	207.	230.	218.	217.	221.	303.	312.	325.
4. U.S. Crops, Prices Received-Latest	209.	187.	190.	192.	210.	266.	216.	212.	249.	265.	261.	264.
5. U.S. Crops, Prices Received-Average	216.	195.	191.	192.	203.	223.	217.	214.	228.	263.	259.	265.
6. Wyoming, All Commodities, Prices Received-Latest	224.	248.	235.	261.	263.	304.	268.	301.	275.	301.	294.	314.
7. Wyoming, All Commodities, Prices Received-Average	233.	241.	241.	260.	268.	283.	273.	294.	288.	283.	304.	308.
8. U.S. All Commodities, Prices Received-Latest	222.	223.	220.	222.	237.	235.	232.	237.	253.	265.	265.	272.
9. U.S., All Commodities, Prices Received-Average	222.	227.	223.	222.	233.	234.	235.	238.	245.	263.	263.	270.
10. Wyoming Livestock, Prices Received-Latest	225.	257.	242.	278.	280.	327.	283.	325.	287.	295.	289.	307.
11. Wyoming Livestock, Prices Received-Average	233.	247.	248.	276.	286.	300.	289.	317.	308.	277.	301.	303.
12. U.S. Livestock, Prices Received-Latest	234.	256.	247.	249.	261.	201.	248.	260.	258.	267.	269.	281.
13. U.S. Livestock, Prices Received-Average	229.	255.	251.	250.	242.	241.	252.	259.	261.	264.	267.	277.
14. Prices Paid by U.S. Farmers-Average	326. ³	324.	321.	327.	331.	336.	335.	339.	348.	352.	354.	359.

¹First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.

²The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

³This figure is for the month of April. This index is now reported in the months of January, April, July, and October.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics.

Table 8: Banking and Finance

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. Total Bank Loans and Leases Financing Receivables (T\$)	2108551.	2066324.	2003375.	1932753.	1931400.	1779168.	1765203.	1733754.	1787542.	1777474.	1758410.	1740029.
2. Total Bank Deposits (T\$)	3797038.	3787785.	3912276.	3741328.	3740737.	3688191.	3792473.	3671572.	3705311.	3712403.	3753325.	3623495.
3. Total Non-Interest-Bearing Deposits (T\$)	620064.	611410.	638317.	559803.	591011.	582741.	603809.	531243.	564608.	572367.	577610.	525702.
4. Savings and Loan Mortgage Loans (T\$) ¹	817750.	811230.	787910.	810354.	812614.	794162.	772721.	744492.	740954.	726300.	711602.	719240.
5. Savings and Loan Deposits (T\$)	1137374.	1137155.	1148406.	1120110.	1104107.	1104332.	1137196.	1119558.	1107268.	1107961.	1070072.	1032814.
6. Prime Interest Rate ²	8.50	7.50	7.50	7.50	8.25	8.70	8.75	8.50	9.00	10.00	10.50	11.5

¹Only members of the Federal Home Loan Bank Board are included. Indicates amount at the end of the quarter.

²Prime rate charged by banks on short-term business loans. Rate is for last month of the quarter.

Sources: Series 1-3: Office of the State Examiner of Wyoming, Abstract Report of State and National Banks in Wyoming, Published Quarterly.
 Series 4 and 5: Federal Home Loan Bank of Seattle, Monthly Report. Comparative statistical analysis of member institutions.
 Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 9: Business Conditions

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. New Domestic Corporations	301.	262.	307.	256.	270.	267.	254.	300.	298.	246.	221.	274.
2. New Foreign Corporations	223.	189.	217.	206.	232.	259.	229.	208.	196.	208.	232.	210.
3. Total New Corporations	524.	451.	524.	462.	502.	526.	483.	508.	494.	454.	453.	484.
4. Business Failures	83.	89.	64.	47.	72.	56.	53.	75.	52.	34.	32.	31.
5. Value of Business Failures (\$)	-2898465.	7242872.	12405831.	2935220.	5896578.	5918282.	14181020.	11499022.	3906790.	28339514.	36551338.	3120102.
6. Personal Bankruptcies	321.	288.	340.	333.	359.	301.	308.	271.	351.	306.	306.	274.

¹ Assets exceed liabilities.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.

Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 10: Construction

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. New Residential Dwelling Units	544.1	494.	317.	270.	458.	744.	297.	304.	449.	339.	292.	233.
2. Value of Residential Dwellings Constructed (M\$)	33.4	33.0	21.6	17.6	34.2	59.4	34.3	23.5	37.3	28.8	22.9	18.3
3. Value of Nonresidential Construction (M\$)	38.7	51.3	9.2	6.8	39.7	23.0	18.2	4.2	35.2	7.0	10.2	11.0
4. Building Permits Issued in Selected Wyoming Cities	3979.	3698.	2112.	1015.	2841.	3953.	2451.	1489.	2763.	2220.	2082.	1578.
5. Value of Authorized Construction (T\$)	49454.	38669.	20453.	9083.	23444.	24258.	13633.	15559.	25330.	21878.	18071.	8866.
6. Mortgage Interest Rate ¹	9.74	9.74	9.43	8.77	9.05	9.03	8.78	8.77	8.72	8.90	9.03	9.66

¹Conventional first mortgage for new home purchase. U. S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Local Construction Potentials." Published monthly.
 Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.
 Series 6: U. S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 11: Consumers

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. New Truck Registrations	3650.	3951.	2993.	2253.	3155.	3011.	3391.	2867.	3508.	3203.	3227.	3086.
2. New Car Registrations	3804.	4181.	2784.	2211.	3171.	5332.	3027.	2736.	3147.	2969.	2849.	2538.
3. Wyoming Personal Income (M\$)	6592.	6277.	6127.	6108.	6288.	6235.	6287.	6261.	6524.	6453.	6584.	INA
4. U.S. Disposable Income (B\$)	3010.	3038.	3062.	3126.	3147.	3225.	3316.	3376.	3421.	3507.	3564.	3696.
5. U.S. Personal Income (M\$)	3508300.	3537997.	3590393.	3664374.	3722315.	3786079.	3902016.	3922767.	3995275.	4077502.	4172895.	INA
6. Latest U.S. Consumer Price Index (1982-1984=100) ¹	323.0	324.9	325.7	111.0 ²	112.4	113.8	114.2	115.1	116.7	118.5	119.2	120.8
7. Quarter's Average U.S. CPI	321.6	327.1	325.4	110.5 ²	112.0	113.3	114.2	114.8	116.7	117.8	119.5	120.2
8. Liquor Sales (T\$)	7500.	8334.	8811.	5421.	6673.	7616.	8379.	5679.	6714.	7041.	8368.	5530.

¹Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers.

²Beginning January 1987, the consumer price index, previously expressed on a base of 1967=100, has been rebased to 1982-84=100. Selection of the 1982-84 period was made to coincide with the updated expenditure weights, which are based upon data tabulated from the Consumer Expenditure Surveys for 1982, 1983, and 1984. Historical data on the new base or additional information regarding these changes is available from the Bureau of Labor Statistics, Washington, D.C. 20212.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
 Series 3,4: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published quarterly.
 Series 4,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
 Series 8: Wyoming Liquor Commission. Sales data are reported to IPR.

Table 12: Employment and Labor¹

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. Civilian Labor Force	253139.	255514.	243637.	238819.	248444.	242054.	230684.	228734.	233949.	235003.	232159.	226172.
2. Employment	230952.	235065.	221405.	209316.	226738.	225635.	214312.	209923.	220780.	223829.	216417.	208738.
3. Unemployment	22187.	20449.	22233.	29503.	21707.	16419.	16371.	18811.	13168.	11174.	15741.	17434.
4. Unemployment Rate	8.8	8.0	9.1	12.4	8.7	6.8	7.1	8.2	5.6	4.8	6.8	7.7
5. Initial Claims Filed	13146.	11710.	14560.	13392.	8086.	6386.	9983.	10949.	6888.	5376.	9709.	10334.
6. Applications Received	14968.	13057.	10542.	10013.	11276.	9067.	9470.	NA	NA	NA	NA	NA
7. New Non-Agricultural Openings	10595.	10997.	7408.	4872.	9615.	9532.	8342.	NA	NA	NA	NA	NA
8. New Non-Agricultural Placements	8490.	8869.	7149.	4182.	8020.	7117.	8061.	NA	NA	NA	NA	NA
9. Miners' Average Weekly Hours	42.0	42.0	42.7	40.9	40.8	42.7	45.4	42.9	44.1	43.7	43.1	46.3
10. Miners' Average Weekly Pay (\$)	609.92	609.39	627.13	599.03	602.91	605.87	637.42	625.72	649.91	640.19	650.14	678.68
11. Miners' Average Hourly Wage (\$)	14.53	14.51	14.68	14.66	14.79	14.19	14.04	14.60	14.75	14.65	15.07	14.67

¹The most recent year's data are preliminary.

Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published monthly.

Table 13: Energy and Mineral Production

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. Wyoming Coal (TST)	30093.	34406.	36350.	35184.	33887.	39261.	38831.	37323.	40802.	41355.	42257.	39086.
2. U.S. Coal (TST)	222359.	215298.	222291.	222892.	219022.	226784.	246314.	231473.	230464.	241952.	258662.	241903.
3. Wyoming Oil (TBDP)	330.	327.	317.	310.	302.	310.	317.	320.	302.	309.	310.	309.
4. U.S. Oil (TBDP)	8815.	8505.	8390.	8371.	8339.	8227.	8347.	8304.	8301.	8185.	8073.	7900.
5. Wyoming Natural Gas (MMCFD) ¹	1243.	888.	1692.	1453.	1281.	1171.	1203.	1430.	1334.	1135.	INA	INA
6. U.S. Natural Gas (MMCFD)	44326.	43457.	46953.	50801.	45830.	44335.	49241.	50768.	46453.	44547.	49358.	INA
7. Active Rig Counts in Wyoming-Average	25.	22.	38.	23.	27.	47.	61.	40.	33.	43.	31.	20.

¹Beginning with fourth quarter 1986, Wyoming gas includes carbon dioxide production.

Sources: Series 1,2,5, and 6: U. S. Department of Energy. Energy Data Reports. Gas data are from Natural Gas Monthly, and the Wyoming Oil & Gas Conservation Commission. Coal data are published weekly.

Series 3-4: The Oil and Gas Journal. U.S. and Wyoming Oil Production. Published weekly.

Series 7: Petroleum Information Corporation, Hughes Tool Company. Monthly Average Active Rig Counts in Wyoming.

Table 14: Government

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. Sales and Use Tax Collections (T\$)	47695.	55716.	51058.	39867.	39591.	44922.	47115.	42585.	42769.	49721.	46445.	41823.
2. Violent Crime ¹	380.	374.	269.	299.	325.	435.	354.	354.	371.	431.	308.	INA
3. Nonviolent Crime ²	5485.	5265.	4294.	3955.	4772.	5057.	4420.	3713.	4562.	4662.	3917.	INA
4. Stolen Property (T\$)	3713.	2420.	2222.	1880.	2342.	2494.	2199.	1770.	1986.	2467.	2272.	INA
5. Stolen Property Recovery Rate	54.0	38.6	31.0	41.4	35.7	33.1	34.1	42.2	43.1	35.5	36.0	INA
6. Percent of Crimes Cleared ³	24.7	25.2	36.4	32.0	26.6	44.2	34.5	33.7	28.3	30.9	40.0	INA

¹Murder, negligent homicide, forcible rape, robbery, aggravated assault.

²Burglary, larceny, auto theft.

³Clearance of a crime indicates resolution of a complaint by arrest or other extraordinary means.

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and Use Tax Division. "Net Collections by Business Class by County." Published monthly.

Series 2-6: Uniform Crime Reporting Center for Criminal Justice Research, Division of Criminal Identification, Office of the State Attorney General. "Crime in Wyoming." Published quarterly.

Table 15: Tourism

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
<u>Visitors, National Parks and Monuments</u>												
1. Yellowstone	79077.	607923.	1593749.	124314.	75835.	681163.	1692818.	168613.	83736.	649842.	1268270.	216076.
2. Grand Teton	138794.	530991.	1314373.	196051.	141570.	535659.	1486479.	264932.	144982.	624400.	1083754.	223562.
3. Devil's Tower	9237.	86167.	186134.	16610.	8523.	92700.	215299.	17980.	7121.	109993.	222877.	20702.
4. Fossil Butte	205.	4367.	10105.	1152.	282.	5082.	13793.	1072.	286.	5894.	13838.	1195.
5. Fort Laramie	2027.	28120.	52465.	3863.	1305.	35117.	50167.	4437.	1172.	24384.	49631.	4145.
6. Big Horn NRA-South ¹	18574.	53634.	65696.	40878.	22056.	55064.	70305.	40782.	30045.	60727.	58820.	35558.
<u>Other Tourism Indicators</u>												
7. Traffic Count (Avg. number of Vehicles/Day)	90397.	119613.	147829.	91685.	78349.	116920.	163546.	113385.	88529.	142830.	178675.	118023.
8. Hotel, Motel, and Camp Sales Tax (T\$)	862.	1185.	2205.	1364.	928.	891.	1821.	1871.	947.	1050.	2106.	1929.
9. Gasoline Sales (TGL)	62891.	76603.	95902.	68488.	56561.	79620.	98146.	71190.	62295.	81811.	96106.	61807.

¹Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
 Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
 Series 8: Wyoming Department of Revenue and Taxation. "Sales and Use Tax Summary by County by SIC Major and Minor." Reported monthly.
 Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 16: Utilities¹

Calendar Quarters	2/86	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89
1. Residential Electric Connections	179931.	179179.	177718.	177613.	177091.	176113.	175745.	175879.	175896.	176333.	177122.	176457.
2. Residential Electric Consumption (TKWH)	502703.	342033.	300186.	408558.	476965.	337943.	291941.	399068.	505669.	351036.	301098.	401776.
3. Commercial Electric Connections	33606.	33885.	33786.	33880.	33355.	33744.	33898.	33780.	33602.	33722.	33846.	33756.
4. Commercial Electric Consumption (TKWH)	499198.	425035.	418211.	486495.	438712.	403123.	419465.	416675.	456190.	420630.	425495.	426766.
5. Industrial Electric Connections	2927.	2811.	2884.	2655.	2989.	2791.	2796.	2764.	2760.	2748.	2921.	2872.
6. Industrial Electric Consumption (TKWH)	1514740.	1313271.	1452583.	1708946.	1718924.	1587866.	1740306.	1819191.	1788103.	1815370.	1720051.	1847617.
7. Other Connections ²	3451.	3285.	3317.	3030.	2801.	3201.	3195.	2680.	2965.	3690.	3899.	3404.
8. Other Consumption (TKWH)	11110.	41061.	66445.	55088.	47998.	51328.	84447.	16355.	10451.	24283.	64994.	13221.
9. Residential Natural Gas Connections	76146.	75383.	74548.	75188.	75206.	74384.	73512.	72654.	74286.	73935.	90673. ³	93300.
10. Residential Natural Gas Consumption (MCF)	3860776.	1833160.	1013300.	2661644.	3840399.	1944656.	740699.	2274494.	4310738.	2042533.	826220. ³	2521850.
11. Commercial Natural Gas Connections	10926.	6651.	6545.	6623.	6652.	6617.	6546.	6520.	6643.	6560.	8357. ³	9398.
12. Commercial Natural Gas Consumption (MCF)	1890077.	1760704.	398174.	1125927.	1687452.	939284.	408459.	997247.	1939461.	957241.	475106. ³	1349515.
13. Industrial Natural Gas Connections	91.	91.	91.	95.	98.	93.	88.	87.	88.	90.	90.	78.
14. Industrial Natural Gas Consumption (MCF)	2914089.	1885998.	1309870.	1770920.	1129556.	601308.	508551.	828532.	3249154.	482088.	2324709.	2504087.
15. Other Natural Gas Connections	42.	40.	38.	37.	37.	37.	38.	101.	39.	36.	35.	34.
16. Other Natural Gas Consumption (MCF)	216.	1136.	5478.	132.	170.	1225.	7352.	6988.	12922.	1920.	7488.	232.

¹ Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

² "Other" includes agriculture, municipal, and other public.

³ Starting with third quarter, 1988, the figures for Residential and Commercial Natural Gas Connections and Residential and Commercial Natural Gas Consumption reflect the merger of Northern Gas Division, Northern Utilities Division, and Northern Mountain Gas Company now doing business as Northern Gas of Wyoming.

Sources: Series 1-16: Reports to IPR by selected electric and natural gas utility companies. Survey conducted monthly.

FORMAT

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 1st quarter of 1986, and end with the 4th quarter of 1988. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Quarters are calendar quarters. For example, the 4th quarter is composed of October, November and December. In the table headings and narratives, a particular quarter will be indicated by notation such as 3/86 (3rd quarter, 1986), 4/86 (4th quarter, 1986), and so on.

Beside each data series name is an abbreviation in parenthesis. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the State unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronym "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from IPR. A list of sources follows the footnotes.

Key to Units Abbreviations

MBF - Thousand Board feet	CWT - Hundred Weight
KWH - Kilowatt Hours	ST - Short Tons
TKWH - Thousand Kilowatt Hours	HST - Hundreds of Short Tons
\$ - Dollars	TST - Thousands of Short Tons
H\$ - Hundreds of Dollars	\$/ST - Dollars Per Short Ton
T\$ - Thousands of Dollars	HBBL - Hundreds of Barrels
M\$ - Millions of Dollars	TBPD - Thousands of Barrels Per Day
B\$ - Billions of Dollars	MCF - Thousands of Cubic Feet
GL - Gallons	HMCF - Hundreds of MCF Per Day
TGL - Thousands of Gallons	MMCFD - Million Cubic Feet Per Day

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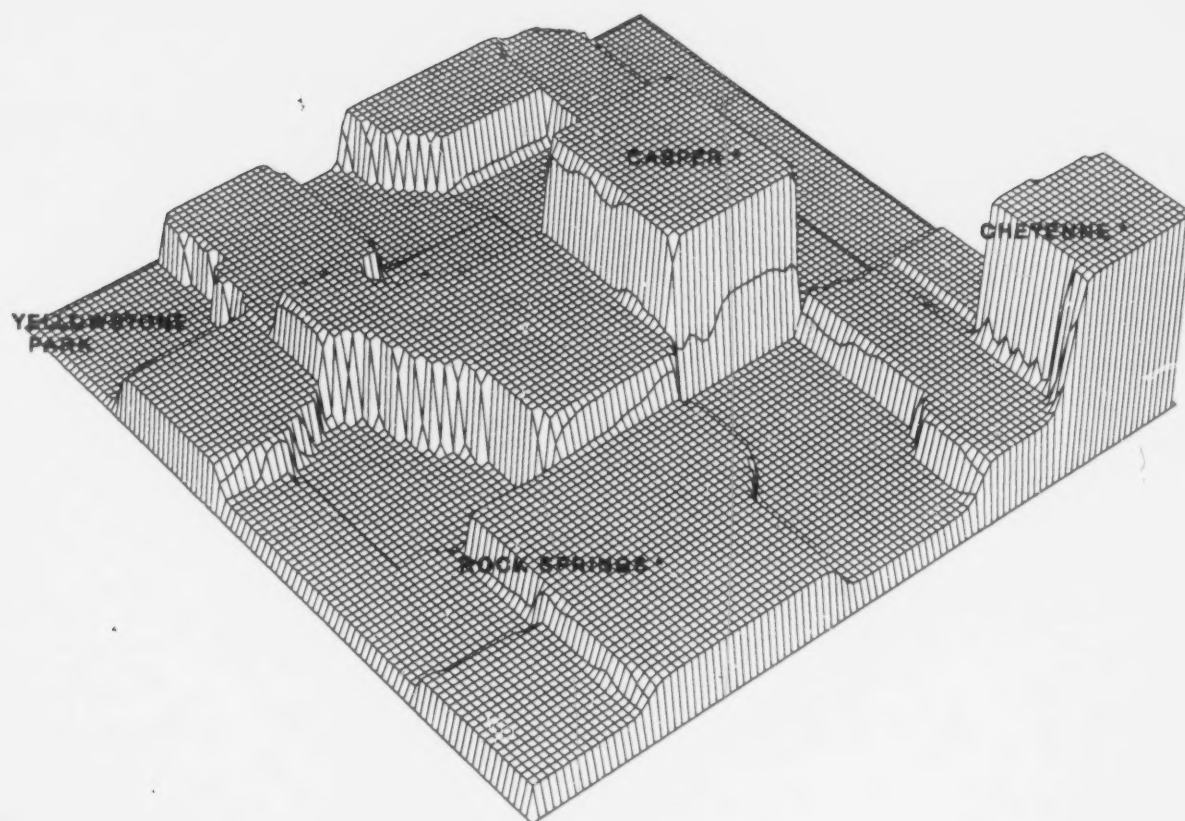
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WYOMING QUARTERLY UPDATE

SUMMER 1989

Vol. 8, No.4

U UNIVERSITY OF
WYOMING



SRC
SURVEY
RESEARCH
CENTER

NUMBER OF PHYSICIANS BY COUNTY, AUGUST 1989

SURVEY RESEARCH CENTER
DEPARTMENT OF POLITICAL SCIENCE
UNIVERSITY OF WYOMING

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Survey Research Center at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of SRC greatly appreciates the ongoing, helpful cooperation of each of the data sources.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by SRC. Readers are encouraged to contact the Center to find out how to gain access to data which do not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a graph showing the number of physicians present in each county as of August 3, 1989. Statistics were obtained from the Wyoming State Board of Medical Examiners and includes physicians and osteopathic physicians. Although numbers seem congruent with population, one can see that many rural counties have a potential shortage of doctors. The data used for the graph are listed below. For more information on health concerns in Wyoming see the Feature Article section of this edition.

County	# of Physicians	County	# of Physicians	County	# of Physicians
Albany	43	Hot Springs	6	Sheridan	43
Big Horn	5	Johnson	4	Sublette	3
Campbell	36	Laramie	133	Sweetwater	37
Carbon	15	Lincoln	10	Teton	32
Converse	6	Natrona	125	Uinta	20
Crook	2	Niobrara	3	Washakie	9
Fremont	63	Park	34	Weston	3
Goshen	10	Platte	5	Yellowstone	2

First-time readers of WQU should refer to the "format" explanations on page 46 for keys on how best to use and interpret data presented in this publication.

For additional information, contact:

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The articles appearing in this publication represent the opinions of the authors and do not necessarily reflect the views of the State of Wyoming or the University of Wyoming or their respective executive officers. Duplication or quotation of material in this publication is welcomed, but it is requested that WQU, the Survey Research Center, University of Wyoming, be credited.

WYOMING
SOCIES

Overview & Perspectives

By the end of the second quarter (April, May, June) tourism in the state was again on the rise. While the number of visitors to Fort Laramie, Fossil Butte, and the southern portion of the Bighorns was down from last year, Devils Tower, the Grand Tetons, and Yellowstone were each reporting an increased visitor count of 2%, 13.7%, and 9.3% respectively. Visitation to Devils Tower has gradually increased over the last two years prompting Congressman Craig Thomas to support an increase in funding for capitol improvements and tourism enhancements at the Tower.

The concern over the effect of the 1988 fires in Yellowstone seem to have been unnecessary. Part of the reason tourism at Yellowstone was unaffected might be the new marketing strategy used by the Wyoming Travel Commission this summer to promote Yellowstone and Wyoming in general. The Commission organized a satellite media tour which primarily targeted the Midwest and West coast markets and enabled over 30 television stations to conduct interviews with Wyoming Travel Commission Director Gene Bryan. While the project cost an estimated \$28,000.00 preliminary figures look very positive.

Wyoming's unemployment rate remained fairly steady in the second quarter of 1989. Unemployment rates ranged from a low in April of 5.9% to a high in June of 6.1%. The unemployment rate of 5.9% was the lowest April rate since 1982 and earned Wyoming a ranking of tenth in the nation. Within Wyoming, Niobrara, Albany, and Teton Counties had the lowest unemployment rates in April of 3.3%, 3.7%, and 4.0% respectively. This trend continued through the end of the second quarter with Teton County having a record low of 1.1% in June. Counties with the highest unemployment rates for second quarter were Lincoln and Uinta while Natrona claimed the distinction of the county with the highest number of unemployed. Employment growth for the state as a whole is concentrated in lower paying service industries.

The states business sector is showing some growth with 551 new businesses (both foreign and domestic) applying for charters in April, May, and June. This figure is up from the second quarter total in 1988 of 494. This growth is coupled with a decline in business failures for the second quarter from 52 in 1988 to 30 in 1989. In fact, bankruptcies in general have declined the first six months of 1989 with 707 companies and individuals filing for bankruptcy compared to 744 in 1988 and 850 in 1987. Total bankruptcies in 1988 reached 1440 and the estimated number of bankruptcies in 1989 is expected to decline to 1350. While these figures are encouraging they are still way below the pre-1980 figures of less than 500 annually.

The old adage, "I've got some good news and some bad news," sums up the state's total personal

income situation. Total personal income is defined as income received from all sources, including any payments received from the government, and in Wyoming this income grew 5.7% from the first quarter of 1988 to the first quarter of 1989. The bad news is this is the lowest increase of the fifty states. The good news is a 5.7% increase demonstrates a drastic improvement over a 3.4% decline in 1987 and only a 3.6% increase in 1988 for the same time period. The growth of total personal income in Wyoming was the greatest in the service sector with a 15% increase and the lowest in the government and mining sectors with a 3% rise. Within the government sector, state and local government saw a .2% decrease in total personal income.

Look for the following activities, appropriations, and actions to have some effect on Wyoming's economy.

- A bill which would appropriate more than \$11 million for completion of the Buffalo Bill Dam has been submitted by Congressman Craig Thomas.
- Senator Alan Simpson is co-sponsoring legislation which would enable law enforcement officials in rural areas to enhance drug interdiction resources. This Rural Drug Initiative Act would make it possible for Wyoming to receive an additional \$333,000 in funding.
- The Senate Armed Services Committee has approved a military spending bill which includes \$100 million in federal funding for military construction projects in southeastern Wyoming.
- The Economic Development and Stabilization Board is in the process of developing a program which would help businesses find trade shows and hook businessmen up with contacts outside the state.

Terry Haven
Editor
Survey Research Center
University of Wyoming

Summer Minerals Update

OVERVIEW

So much for predicting who is Number One in coal production! Despite my doubts last quarter, Wyoming did produce enough coal in 1988 to make it Number One among the coal-producing states. Kentucky lost its long standing first place by more than two million tons. If production in the first three months of 1989 are any indication, Wyoming will set another record this year. With the wildcat strikes that began in June in the eastern coal fields, Wyoming's chances of remaining on top are even better.

In regard to oil prices, the outlook remains guardedly optimistic. The posted price has hovered around \$19 per barrel throughout the second quarter. The purchase price for most Wyoming oil, however, is about \$1.00-\$1.50 less than the posted price due to gravity adjustments. First and second quarter prices are certainly an improvement over the prices at the end of last year. In fact prices haven't been this high since the middle of 1987. It is notable that prices have risen much faster in 1989 than they did back in 1987. Now the main concern is how long prices will stay up around \$19. If the trend of 1987 is any indication, the price may not hold for more than three months. Only time will tell on this one.

In regard to natural gas, everyone is waiting to see who will build a pipeline from Wyoming to the California markets. While most of the players are the same as in the last quarter, there is a new entrant as well as a new coalition of old players to complicate anyone's chances of forecasting the outcome. The bottom line is that there is now much less doubt that one or more pipelines will indeed be built. With the entry of the Altamont Group, the Canadians have set the stage for a Canada to Wyoming to California pipeline. The Altamont Group wants to tie their line into the Kern River or WyCal line at Opal, Wyoming. What's more, this proposed project would be capable of delivering nearly twice the gas of any other proposal.

If that isn't enough to excite the imagination, the Kern River and Mohave Pipeline Projects have formed a coalition rather than fight each other. It's no wonder that some of the members of the Wyoming Pipeline Authority are beginning to wonder if Wyoming's proposed low-interest loan will be necessary at all. "Kicker" clauses in the proposed loan agreement, however, might still provide incentives to increase the volume of Wyoming gas that goes into the pipeline and might accelerate the completion of a pipeline.

In a related item, Governor Mike Sullivan has become the Chairman of the Interstate Oil

Compact Commission (IOCC), which is a federation of 29 oil-producing states. A major effort of the IOCC is to gain support for a National Energy Policy.

The second quarter of 1989 also documented continued high demand for soda ash from the trona patch in Sweetwater County. Cement production from the Mountain Cement Company in Laramie was running at plant capacity. And there is a resurgence of interest in Wyoming's uranium deposits, principally in the application of solution mining techniques.

Gary B. Glass
State Geologist and Director
Geological Survey of Wyoming

OIL AND GAS UPDATE

A major new pipeline proposal that would help supply the California natural gas market was announced near the end of May. The Altamont Group, comprised of Amoco Canada Petroleum Company Ltd., Mobil Oil Canada, Petro-Canada Inc., and Shell Canada Ltd., proposed a 30-inch diameter pipeline that would originate in Wildhorse, Alberta, Canada, cross Montana and Wyoming, and terminate at Opal, Wyoming. The pipeline would have an initial capacity of 700 million cubic feet of natural gas per day and would give the Altamont Group the option to supply gas to the Midwest, to the South, and to the Northwest through existing pipeline systems and to supply California markets through the proposed Kern River or WyCal pipelines which would have to increase their capacities to 1.2 to 1.5 billion cubic feet per day. According to Altamont, under their proposal Wyoming gas producers could get as much as a 15 cents per thousand cubic feet (MCF) discount on transportation costs to California. This compares with an estimated 6-7 cents per MCF discount on transportation costs if the State provides a low-interest loan to Kern River or WyCal. The individual members of the Altamont Group produce 31 percent of all Canadian gas. The group plans to file an application with the Federal Energy Regulatory Commission (FERC) in June, 1989, and expects to begin construction by late 1992 if FERC approval is timely. Construction of the line would create an estimated 3,000 seasonal jobs for Montana and Wyoming workers. Altamont also projects \$7 million in property tax payments in Wyoming and Montana.

In a related item, Southern California Edison Company, which serves 3.8 million customers in central and southern California, signed a letter of

intent to transport a minimum of 50 million cubic feet of gas per day for 15 years on the WyCal system. WyCal also signed a 20-year agreement with Pacific Gas and Electric Company for 50 million cubic feet of gas daily.

Mojave Pipeline Co. and Kern River Transmission Co. have agreed to coordinate their efforts to deliver natural gas to California. The agreement calls for Kern River to build their pipeline from Opal, Wyoming, and Mojave to build their pipeline from Topock, Arizona. The two lines would merge at Barstow, California, and continue to the oil fields of Kern County. The two companies will submit a final settlement agreement to the FERC by August 31, 1989.

Even though the average posted price for Wyoming Sweet crude oil increased steadily between November of 1988 and April of 1989, the Wyoming rig count dropped during that time period. Although there was a small seasonal increase in rig count in May and June, the count still was not responding to the higher prices. In past years these prices would have stimulated higher exploration activity, but most companies seem to have adopted a wait-and-see attitude. It is apparently hard to forget the lower prices brought on by OPEC overproduction in 1986, 1987, and 1988. Many oil companies appear to be planning for conditions which are likely to occur over the next ten years rather than on the short-term price behavior. If OPEC's June production agreement holds, prices for Wyoming crude oil should stabilize in the \$18 to \$20 range over the next few months.

True Oil Company's plans to drill 13 wells in Sublette County have been delayed by concerns over the effects the drilling may have on Colorado cutthroat trout in the Green River. A 1988 Environmental Analysis (EA) of the proposed wells found that an environmental impact statement was unnecessary, but subsequent reviews uncovered concerns that drilling could endanger the trout's habitat. A supplement to the earlier EA will have to be written. The U.S. Forest Service hopes to have the issue resolved by August of 1989.

Lease sales in the State are still doing well despite the low drilling activity. The high per-acre bid at the Wyoming Department of Public Land's May sale was \$155 by Yates Petroleum for a 280-acre parcel in section 35, T.50N., R.71W., which offsets Minnelusa oil production in AG Farm Field. Farmer Energy also paid \$155 per acre for a 40-acre lease in section 21, T.53N., R.69W. This lease is about a mile north of Minnelusa oil production at Candy Draw Field. Hanson and Strahn paid \$150 per acre for 560-acre parcel in section 36, T.48N., R.72W. about a mile east of Minnelusa oil production at Oxbow Field. Yates Petroleum of Artesia, New Mexico, was the most successful bidder in the sale as they picked up 47 tracts.

The high bid at the April U.S. Bureau of Land Management (BLM) sale was \$390 per acre by Enron Oil and Gas for a 75.7-acre lease in sections

13 and 24, T.28N., R.113W. Enron recently announced plans to double production in this area. Yates was once again the most successful bidder as they leased another 47 tracts at this sale. Paul Sawyer made the high per-acre bid of \$160 at the BLM's June sale for a 200-acre lease in section 20, T.49N., R.73W. The lease is about two miles northeast of Minnelusa oil production at Lewis Field and about two miles southwest of Muddy Sandstone production at S-Bar Field. Yates Petroleum was the high bidder on 51 parcels. The bids at the June sale may have been smaller than normal because the sale was protested by the Wyoming Wildlife Federation and the National Wildlife Federation. Bidders were given a list of 68 tracts on which the Wyoming Wildlife Federation felt the BLM's stipulations were inadequate. A BLM spokesman said that if there was merit to the protest, the leases will not be issued.

In June the U.S. Senate approved the removal of all Federal price controls on natural gas by 1993. The House passed a version of the bill earlier this year. Both versions would phase out price caps on gas produced from fields developed before April, 1977. The legislation would probably affect the price of only about six percent of domestic gas production. The price of most domestic gas was decontrolled in 1978.

The BLM will waive restrictions on oil and gas drilling on the 125,000-acre Rattlesnake antelope and deer winter range west of Casper if vegetation and weather conditions are favorable. The BLM has allowed winter drilling for the past two years. The waiver will be made only upon request and on a case-by-case basis.

Unocal Corporation joined a long list of oil companies that have transferred workers from Wyoming. While the company announced that it will transfer about 35 exploration personnel to other offices, the number of production personnel will probably remain the same or possibly increase slightly.

Based on company data and on information compiled and published by Petroleum Information, the following significant exploration and development events occurred in Wyoming during the second quarter of 1989:

A. The 2 Wadsworth-Federal 5-32 discovery well in section 5, T.12N., R.113W., produced 20 barrels of oil and 1.5 barrels of water on an eight-hour swab test of the Dakota. Reportedly, the productive zone will be stimulated with a sand-hydraulic fracture treatment. The well is about four miles northeast of Dakota production at Luckey Ditch Field and three miles southeast of Dakota production at Henry South Field.

B. Texaco, Inc. completed a discovery well, the 1 Federal-24 in section 24, T.24N., R.111W. The well flowed 5.1 million cubic feet of gas and 420 barrels of condensate per day from the Dakota during tests; however, during the first month of

production, the well produced an average of 5.8 million cubic feet of gas and 294 barrels of 60.3° API gravity condensate per day. The well is nearly a mile east of the nearest Dakota producer in Blue Forest Field.

C. Drilling activity in the Bighorn Basin has picked up recently. Terra Resources is producing oil from the Phosphoria Formation at their 32-26 Sagebush Federal discovery in section 26, T.51N., R.92W. No further details are available. Terra will try to confirm their discovery at the 11-25 Sagebush Federal in section 25, T.51N., R.92W. Texakoma Oil and Gas plans to drill a Madison test in section 13, T.51N., R.92W., two miles northeast of Terra's discovery.

D. Coastal Oil and Gas scheduled a Dakota test on the east side of the Hanna Basin in section 21, T.22N., R.80W. Thus far, this township has had no production. The well is about five miles northeast of past production from the Frontier, Muddy, and Dakota at Simpson Ridge Field and about 6 miles northwest of Morrison and Nugget gas production at Chapman Draw Field.

E. W.A. Moncrief's 28-1 Popskull well in section 28, T.35N., R.75W. was completed for an initial flowing potential of 90 barrels of oil and 34 MCF of gas per day from the Muddy Sandstone. Nearest production is from the Frontier Formation about five miles west at V-Two Draw Field. Sun Exploration and Production will drill a well a little over two miles northeast of the 28-1 Popskull which will test the Frontier, Muddy, and Dakota.

F. True Oil is planning to drill a Madison test in section 17, T.37N., R.82W. on a structure that may have been created by a meteor impact. The well is six miles northwest of Casper Creek North Field. There have been two previous unsuccessful tests in the area.

G. Kerr-McGee Corporation has drilled another very good well in North Buck Draw. The 31-18 North Buck Draw Unit in section 18, T.41N., R.73W. flowed 1,725 barrels of 44° API gravity oil, 2.7 million cubic feet of gas, and three barrels of water per day from the Dakota. The company is drilling another well about a mile to the north. North Buck Draw Field had been shut in recently until hydrocarbon gas could be injected into the Dakota to maintain reservoir pressure and increase recovery. Since that project started, production from 11 wells averaged over 8,500 barrels of oil and over 2.7 million cubic feet of gas per day during the first three months of 1989.

H. Yates Petroleum, the most active bidder in recent Wyoming lease sales, has an apparent Minnelusa producer in the Einer Field area south of Gillette. The 42-9 Saunders well in section 9, T.49N., R.72W. was drillstem tested between 10,310 and 10,335 feet. Recovery was 272 feet of oil and 372 feet of oil and water-cut mud. This well is a north offset to the 43-9 Saunders well in the same

section, which was completed last year pumping 190 barrels of oil and four barrels of water per day from the Minnelusa.

I. Also in the Powder River Basin, Conoco will attempt to extend the Minnelusa productive trend to the southwest. The company staked a 12,600-foot test in section 23, T.47N., R.74W. Nearest Minnelusa production is about eight miles east in the Hawk Point Field area.

J. The first commercial, coal bed methane, gas field in the Powder River Basin is now on stream. BETOP, Inc. is producing the gas from four shallow wells with an average depth of 400 feet at their Vandekoppel prospect six miles northwest of Gillette. The producers are the 3-20 Rawhide, the 2003 DEQ, the 7-20 Rawhide, and the 2002 DEQ in section 20, T.51N., R.72W. Production is from about 140 feet of subbituminous coal (Wyodak coal bed) in the Fort Union Formation. BETOP plans to complete three additional wells in the area which will bring production from the field to 2.5 million cubic feet of gas per day. Phillips 66 Natural Gas Co. built a four-mile pipeline to collect the gas at the BETOP field.

As a side note, this field is producing gas in the vicinity of the former Rawhide Village subdivision, which was abandoned in 1987 due to the surface venting of methane gas.

K. Coastal Oil and Gas plans to drill three coal bed methane wells in T.48N., R.77 and 78W. to test a coal in the Fort Union Formation at depths that range from 1,240 to 1,620 feet. These tests are in the vicinity of a thick coal designated Seam 14 (Ayers, 1986) or "Big George" (Kent, 1986). "Big George" is reportedly up to 200 feet thick and averages 113 feet in thickness (Kent, 1986).

L. BETOP will drill another coal bed methane test in section 13, T.50N., R.73W. The well will be a 730-foot Fort Union test. The targeted Wyodak coal bed is 60 - 80 feet thick in this area (Ayers, 1986). Coal bed methane wells in the Powder River Basin, as well as in other areas of the U.S., are on the rise because there is a tax credit for production from such wells. Because the tax credit is due to run out in the near future, companies with coal bed methane prospects are eager to drill their acreage before the deadline.

M. NICOR Exploration has a new producer in South Marnie Field. The 23-24 Kuehne in section 24, T.51N., R.70W. was completed pumping 340 barrels of oil and 3 barrels of water per day from the Minnelusa. The discovery well, the 31-25 Kuehne in section 25, T.51N., R.70W., was completed pumping 229 barrels of oil daily, and the confirmation well, the 14-24 Kuehne in section 24, T.51N., R.70W., was completed pumping 102 barrels of oil and six barrels of water daily.

N. Quintana Petroleum completed an offset to their West Prong area discovery. The new producer, the 2-35 West Prong-Federal in section 35, T.51N.,

R.68W. pumped 335 barrels of oil per day from the Minnelusa.

D. No details have yet been disclosed on a wildcat well drilled by Quintana Petroleum other than it has been completed as a Minnelusa discovery. The 1-35 Shippy in section 35, T.54N., R.70W. is about a mile east of Booten Field and about 1.5 miles northwest of Pownall Ranch Field, both Minnelusa oil fields.

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Geological Survey of Wyoming

COAL UPDATE

Final coal production figures released during the second quarter of 1989 confirm that Wyoming was the nation's leading coal-producing state in 1988. Kentucky's coal production of 161.2 million short tons in 1988, as reported by the Kentucky Department of Mines and Minerals, was about 2.4 million tons less than Wyoming's record 163.6 million tons (reported by the Wyoming State Inspector of Mines). This is not only the first time Wyoming has led the nation in production, but it is also the first time in 15 years that Kentucky has not led the nation in coal production.

National coal production in 1988 was about 959 million tons, which breaks the previous record of 915 million tons set in 1987. Most coal forecasters are expecting 1989 national coal production to be about the same or slightly above 1988 production. Wyoming produced about 17 percent of the nation's coal in 1988. Wyoming's coal production should continue to gradually increase for many years.

Average productivity at Wyoming mines, defined here as the ratio between the number of tons produced and the number of employees, increased in 1988, as each employee accounted for 36,088 tons of coal produced. In 1987, each employee accounted for 33,119 tons of coal produced. At mines in the Powder River Basin, each employee in 1988 accounted for 51,083 tons of coal (compared to 44,290 tons in 1987); in southern

Wyoming mines, each employee in 1988 accounted for 12,869 tons of coal production (compared to 11,764 tons in 1987).

Recently available data on the distribution and utilization of coal in 1988 (Energy Information Administration, 1989) indicates that Wyoming coal was used in 22 states. As in years past, Texas was the largest consumer of Wyoming coal in 1988, followed by Wyoming, Kansas, Oklahoma, and Arkansas. Compared with coal distribution in 1987, only the states of Louisiana, Illinois, Minnesota, and Washington used less Wyoming coal in 1988. Significant increases in usage of Wyoming coal were recorded in Texas (4.3 million tons more), Wyoming (3.3 million tons more), Missouri (2.3 million tons more), Arkansas (1.7 million tons more), and Oklahoma (1.5 million tons more). Seven states each consumed over 10 million tons of coal. Four states consumed over 50 percent of Wyoming's coal and nine states consumed over 80 percent of Wyoming's coal.

Electric utility companies located in 19 different states used 97.6 percent of Wyoming's total coal production in 1988 to fuel steam-electric generating plants. Fourteen different states used Wyoming coal to fuel industrial boilers, and 11 states used Wyoming coal for residential/commercial heating. About 1.4 million tons in the "other industrial" and "residential/commercial" categories went to Wyoming coal users, mostly other mineral-related industries. Four of Wyoming's five iron plants in southwestern Wyoming used coal to generate steam for use in the refining process and in some cases, to produce electricity; many of the State's bentonite plants used coal in their refining process; and Mountain Cement Company used coal in their Laramie plant. Additional coal was used in synthetic coke plants, including FMC Corporation's formcoke plant in Lincoln County (noncoking, Wyoming, subbituminous coal is converted to formcoke through the company's patented process), and in a sugar beet processing plant at Torrington. Although about 84 percent of Wyoming's coal was shipped out-of-state, a small amount of coal (128,500 tons) was imported into the State from Colorado, Montana, Utah, and Pennsylvania.

Transportation of Wyoming coal in 1988 was primarily by rail (92 percent). Although the 147.5 million tons of coal transported by rail in 1988 increased by 14.6 million tons (or 11 percent) over 1987, the proportions of coal carried by each railroad were the same as in 1987. Burlington Northern Railroad (BN) accounted for 68 percent of the total, followed by Western Railroad Properties, Incorporated (WRPI) with 25 percent of the total, and Union Pacific Railroad Company (UP) with 7 percent to the total. WRPI, which reports tonnages carried by the Chicago and North Western Transportation Company (C&NW)/UP joint-venture railroad out of the Powder River Basin, carried 4.3 million tons (14 percent) more coal in 1988 than in 1987. BN and UP both recorded a 10 percent increase in coal tonnage in 1988.

The total tonnage of coal transported by rail in 1988 represents 92 percent of all railroad freight that originated in Wyoming in 1988. A total of 1,458,280 coal cars (averaging about 100 tons each) were loaded at Wyoming coal mines in 1988. Because 100,406 of those coal cars (carrying 10.0 million tons of coal) were unloaded at the various coal-burning facilities within the State, this left 1,357,874 coal cars that exited the State. If a unit train contains 110 coal cars, then 12,344 unit trains were required to move coal out of Wyoming in 1988. This amounted to 33.8 unit trains of coal leaving Wyoming each day as well as another 33.8 unit trains returning!

In another development related to coal transportation, it was announced in early June that CNW Corporation (CNW), the parent company of Chicago and North Western Transportation Company (C&NW), had approved a \$1.6 billion buyout offer from Blackstone Capital Partners L.P. The buyout offer ended a hostile takeover bid by Japonica Partners, an investment banking firm holding an 8.8 percent majority interest in CNW. The Blackstone Partners consist of Blackstone, a New York investment banking firm; CNW management; Donaldson, Lufkin, and Jenrette, Incorporated, a New York securities firm; and Union Pacific Corporation. The buyout must be approved by the Federal government. If the buyout/takeover offer is completed, Blackstone Capital Partner L.P. would be merged into CNW Corporation, with Blackstone holding controlling interest in the corporation. CNW management; Donaldson, Lufkin, and Jenrette, Incorporated; and Union Pacific Corporation would all hold minority positions in the corporation. It is thought that the Blackstone deal will further support the C&NW/UP joint venture railroad out of the Powder River Basin as well as give UP access to Chicago and nine midwestern states (McGraw-Hill, Inc., 1989).

The Wyoming legislature completed its 1989 session in the first quarter, 1989, with the following actions on several coal-related topics:

- 1) Governor Sullivan signed a bill that exempts from taxation any coal burned in the processing or treatment of other coal at the same mine. This benefits coal companies involved in thermal drying and beneficiation of coal, such as Amax Coal Company's coal drying plant at the Belle Ayr mine.
- 2) A bill prohibiting further State investment in clean coal technology was vetoed by Governor Sullivan. The bill was vetoed because in the Governor's opinion it showed a lack of State support for current and proposed clean coal/coal enhancement processes.
- 3) A bill extended the 80 cent per ton cap on severance tax on new contracts signed prior to April, 1991, for two more years. The bill also makes the severance tax cap

valid even if deliveries on the new contract do not begin until after April 1991. This bill is designed to assist producers of high cost coal: surface mined coal taxed at the current rate of 8.5 percent and valued at over \$9.41 per ton and underground mined coal taxed at the current rate of 5.25 percent and valued at over \$15.24 per ton will not be liable for severance taxes of more than 80 cents per ton. The only mines in Wyoming affected by this severance tax cap are the high cost mines in southern Wyoming, the Big Horn mine in Sheridan County, and the Grass Creek mine in Hot Springs County.

- 4) A bill introduced by Campbell County legislators that provided for a 50 percent reduction on half of a coal mine's coal taxes if production increased by 50 percent in a base year did not make it out of the Senate Revenue Committee. This bill was aimed at providing tax relief for companies able to substantially increase production and was primarily designed to help Powder River Basin coal mines unable to take advantage of the 80 cents per ton severance tax cap.

Developments in the Hanna coal field

In April, Arch of Wyoming began hiring additional employees at their Medicine Bow mine west of Hanna in response to new coal sales. Arch is shifting production from the Seminole No. 2 mine, which produced 1.6 million tons in 1988, to Medicine Bow, which produced 0.4 million tons in 1988.

In April, it was announced that Kansas Power and Light's 9-month contract with Medicine Bow for 650,000 tons of coal in 1989 could be expanded by up to 150,000 tons per month if the coal were available. The coal will be distributed to the utility's Lawrence plant (two-thirds of the tonnage) and Tecumseh plant (one-third of the tonnage) both in Kansas.

Pacific Power and Light Company (PP&L) has also purchased unspecified amounts of spot coal from Medicine Bow for test burns in the Jim Bridger power plant east of Rock Springs. The coal from Medicine Bow is being delivered to Jim Bridger via truck.

Public Service Company of Colorado will purchase 150,000 tons of spot coal from Medicine Bow for the Valmont power plant near Boulder. Union Pacific will be the carrier for this coal. In a related development, the State of Colorado has offered a \$1.00 per ton tax rebate to Colorado utility companies that burn more Colorado coal in 1989 than they did in 1988. How this will affect future coal sales from Wyoming coal mines remains to be seen.

Developments in western and southwestern Wyoming

In February, Bridger Coal Company's Jim Bridger mine began construction on a 4-mile long overland conveyor systems that is expected to reduce current hauling distances to the Jim Bridger power plant by more than 10 miles. The 48-inch wide conveyor system will be lengthened as the mine expands to the east. In a further effort to increase efficiency at the mine, Bridger is adding larger scrapers and bulldozers for overburden removal, replacing older rock/coal haulers with 8 new 85-ton capacity trucks, and using cast blasting techniques (by angle drilling) to better place overburden.

Black Butte Coal Company is apparently expanding their operations at their Pit 22 property, formerly Prospect Point Coal Company's Leucite Hills mine. The mine will be expanded from a 0.5 million ton-per-year operation to 1.5 million tons per year. Acquisition on this property increased Black Butte's coal reserves by 21 million tons and added 6,550 acres of coal land to its holdings. Additional mining equipment from the Black Butte's existing property south of Pit 22 was moved onto the new property last summer.

Black Butte also installed a truck loadout facility and a radial stack loader at their main property to the south. The coal company is now supplying coal to PP&L's Jim Bridger plant under a short-term contract. The coal is being delivered to Bridger by 40-ton capacity coal trucks subcontracted from Savage Trucking.

Developments in the Powder River Basin coal field

Several developments involving Powder River Basin coal were announced in the second quarter, 1989. First, Fremont Iron and Steel, Inc. has proposed a mini-steel mill for a site located near the Wyodak power plant east of Gillette. If they can raise \$30 million to build the mill, the mill would recycle scrap metal in the area and employ 110 people at full capacity. The decision to locate the mill near Gillette was based on the proximity of the site to an electrical power source (the coal-fired Wyodak power plant) to power the electric-arc furnaces as well as access to highway and rail transportation. Second, Perkins Power Company of Sheridan and Petro Oil and Gas, Inc. of California announced a joint venture to construct a polyurethane plant/cogeneration unit near Sheridan. The \$50 million project would use a coal gasification process combined with Petro Oil and Gas' plastics production technology to produce 50 tons of polyurethane a day as well as 12 megawatts of power through cogeneration. Petro Oil and Gas will provide construction financing and their technology (the company has a similar plant currently operating in Spain and four plants under construction in China). Perkins Power will provide the plant site, a 12-megawatt power plant (formerly the Acme power plant), and a 20-million-ton coal

deposit located to the north in Montana (purchased from Chevron USA).

In early June, the mining plan submitted by the recently formed Dry Fork Coal Company, a limited partnership between Western Fuels Association (WFA) and Phillips Coal Company, was given final approval by both the State of Wyoming and the Federal government's Office of Surface Mining Reclamation and Enforcement. Construction of the 3-million ton-per-year Dry Fork mine northeast of Gillette was expected to begin immediately. Dry Fork plans to ship its first coal from the mine in August, 1990.

Coal Contracts - Powder River Basin

Coal contract activity involving Powder River mines during the second quarter, 1989, are summarized below:

- 1) A long-term contract between Mobil Coal Producing, Incorporated and WFA to supply Laramie River Power Station with 1.3 million tons of coal per year has evidently been cancelled (Pasha Publications, Inc., 1989). The long-term contract was due to expire in 2013, but now coal shipments from Mobil's Caballo Rojo mine to the power plant near Wheatland will continue only through 1990. It was reported earlier that WFA and two of its member utilities were filing a lawsuit to cancel this contract and that Mobil was filing a countersuit.
- 2) In May, American Electric Power (AEP) announced that it would purchase 5 million tons of coal from unspecified Powder River Basin mines located in Wyoming instead of 3.5 million tons of eastern coal. The coal is for the new Rockport II unit in Indiana that AEP owns jointly with Indiana Michigan Power Company. No specific supplier(s) and no specific contract(s) have been announced yet. Carter Mining Company currently supplies coal to Rockport I on a contract that runs through 2014.
- 3) Northern Indiana Public Service Company (NIPSCO) continued to purchase spot coal on a monthly basis. Amax Coal Company's Belle Ayr mine provided 60,000 tons of coal in April, 110,000 tons of coal in May, and 30,000 tons of coal in June to unspecified NIPSCO generating plants in Indiana. Mobil Coal Producing, Incorporated's Caballo Rojo mine also provided 20,000 tons of coal to unspecified plants in April.
- 4) Big Horn Coal Company recently supplied 15,000 to 20,000 tons of coal to Otter Tail Power Company's Hoot Lake power plant in Minnesota. In the summer of 1988, Otter

Tail Power Company tested coal from a Montana mine and coal from the Rochelle mine in Campbell County. The Hoot Lake plant is currently contracted to use North Dakota lignite through 1995, but the contract is evidently approaching reopener clauses.

- 5) Cordero Mining Company's Cordero mine will be supplying from 0.6 million to 1.2 million tons of spot coal to Iowa Public Service's Neal No. 3 unit at Council Bluffs, Iowa. Deliveries began April 15 and will continue through the end of the year via C&NW and UP railroads.
- 6) Amax Coal Company's Belle Ayr mine will supply from 75,000 to 150,000 tons of coal to Kansas Power and Light Company's (KP&L's) Tecumseh, Kansas, plant for a test burn starting in August, 1989.

Evidently Amax and KP&L signed a contract in 1986 for up to 1.4 million tons of coal per year between 1991 and 2013; the test burn is apparently in preparation for this contract.

- 7) Rochelle Coal Company will supply Wisconsin Public Service Company's Weston No. 3 unit with 220,000 tons of coal during the second half of 1989. Transportation of the coal will be by C&NW and Soo Line Railroad.
- 8) Thunder Basin Coal Company, a coal mining subsidiary of ARCO Coal Company [a company owned by Atlantic Richfield Company (ARCO)], recently signed an agreement with Lower Colorado River Authority (LCRA) for 2.5 million tons of coal per year through 2001. The contract supplements the 1.5 million ton-per-year contract ARCO already had with LCRA, lowers the base tonnage price from \$18 per ton to \$15 per ton (F.O.B. the mine), and prices the additional tonnage of \$5.25 per ton unit 1992. After 1992, the coal will be priced according to the prevailing market level. The coal will be supplied by ARCO's Black Thunder mine via the C&NW Railroad to LCRA's Fayette Power Project in Texas. The utility had previously asked for bids on 2.5 million tons of spot coal, but after awarding the long-term contract to ARCO, LCRA asked for bids on only 238,000 tons of spot coal instead (yet to be awarded).

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INDUSTRIAL MINERALS UPDATE

Aggregate

Pursuant to its seasonal usage, the production of construction aggregate (sand, gravel, and crushed rock) in Wyoming increased in the second quarter and will peak in the summer months. Highway projects consume most of Wyoming's construction aggregate.

The National Park Service (NPS) has begun a project to locate construction aggregate for road and other construction projects in Grand Teton National Park. The Industrial Minerals and Uranium Division of the State Geological Survey is helping the NPS locate sites. Although Jackson Hole has some of the best gravel resources in Wyoming, there is a problem finding suitable aggregate sites for NPS projects. Because much of the area is used solely for recreation and/or wildlife, careful siting of gravel pits is a must for the NPS. It appears at this time that a site near the Jackson Hole Airport will serve the needs of the NPS. This site provided aggregate for the construction of the airport. A site on Spread Creek, which is resupplied with gravel from the creek each year, is another possible source that may also meet NPS' siting requirements.

Bentonite

Bentonite production continues to recover slowly from a recession caused by a decline in oil well drilling. Most of the bentonite mined in this country is used in oil well drilling muds. The uses of bentonite as a sealant in waste-disposal sites and as a ion-exchange agent in the cleanup of toxic-waste sites, however, are increasing. The major bentonite mining regions are in the Black Hills, Bighorn Basin, and Powder River Basin, near Kaycee (Johnson and Natrona Counties).

Cement

Mountain Cement Company operates a cement plant in Laramie. This plant was recently modernized and upgraded to capacity of 500,000 tons of cement per year. Limestone, gypsum, marl, and iron ore found near Laramie are used to make various cement products. This plant is currently operating at full capacity. Nationally, however, cement

production is slightly lower than at the same time in 1988, according to the U.S. Bureau of Mines.

Clinker (baked and fused rock; scoria)

Clinker (baked and fused rock; scoria) is the red rock that caps buttes and hills in the Powder River Basin near Sheridan, Lake De Smet, Buffalo, and north and south of Gillette. It is also found at Hanna and near Wamsutter. It is produced when heat from underlying and burning coal beds, bake and melt overlying shale and other rock. Clinker is used in the Powder River Basin as construction aggregate for highway surfacing, as a surfacing material for gravel roads, and as a light-duty railroad ballast. It is also produced for use as decorative landscape rock. About 150,000 tons were quarried in 1988 for all of these uses.

Limestone

Limestone quarried in Wyoming is used in the manufacture of cement, for construction aggregate, and for emissions control at power plants. Limestone quarries are currently operating near Laramie, Hartville, Lusk, Glenrock, Sundance, Newcastle, and Sheridan.

Phosphate, sulfur, and fertilizer production

The phosphate calcining plant formerly at Leefe, west of Kemmerer near Sage Junction, has been dismantled. There is currently no phosphate mined in Wyoming. Utah phosphate, however, is combined with sulfur from Wyoming at Chevron Chemical Company's fertilizer plant at Rock Springs.

Silica

There is continued interest in Wyoming's silica raw materials. Silica (SiO_2) is the primary ingredient in glass manufacture.² Since the other raw materials used to make most kinds of glass (soda ash, feldspar, and limestone) are found in Wyoming, state and local government agencies have met with private companies and individuals to look for ways to generate venture capital for the establishment of a glass manufacturing plant in Wyoming. At least two private companies are still interested in developing a glass industry in the State.

Two silica deposits, one near Glendo and one near Laramie, are being considered. Local governments obtained funds to investigate these deposits through the Wyoming Economic Development and Stabilization Board's Block Grant Program. The Wyoming Geological Survey has published information obtained on these deposits in two different reports (Harris, 1988a and Harris, 1988b). A third source near Lovell may also be of interest.

Trona

Production at the trona mines is increasing, and employment in the soda ash plants

increased by about 200 from 1987 to 1988. In fact, the production of soda ash and other products from mined trona are at record levels. The five producers near Green River are operating at capacity and are attempting to increase production by increasing efficiency. Additional construction and expansion plans are under consideration.

The causes for this increased activity are an increase in the domestic requirements for soda ash, primarily for the manufacture of glass, and an increase in demand by industrial users that are substituting soda ash for caustic soda. Caustic soda, NaOH , is produced synthetically from lime and sodium carbonate. There has been some interest in producing caustic soda from trona (refined to sodium carbonate) and lime from limestone. Limestone, however, is not found in the immediate vicinity of the trona mines. The closest high-grade limestone is at Rawlins, 120 miles east; south of Sage Junction, about 80 miles west; or south of Manila, Utah, 50 miles south.

FMC closed their pilot in situ solution trona mine in May. While FMC officials say that the operation may be reactivated at some future time, for now, they want to evaluate the results of their pilot study.

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Ray E. Harris, Head
Industrial Minerals/Uranium Division
Geological Survey of Wyoming

URANIUM UPDATE

There are now four companies producing yellowcake (uranium oxide, U_3O_8) in Wyoming. Yellowcake is the mill product that is further refined into the fuel-grade uranium used in nuclear power plants. COGEMA's Pathfinder Mines extracts uranium by open pit methods in the Shirley Basin and then mills it into yellowcake. Everest Minerals and Malapai Resources produce yellowcake from in situ solution mining operations at the Highland and Irigaray-Christiansen Ranch properties, respectively. In addition, U.S. Energy-Crested Corporation has been evaluating methods to produce yellowcake from stockpiled ore at Crooks Gap.

The uranium industry in Wyoming may expand in the near future. Uranex, Inc., a German company, has applied for permits to construct two in situ solution mines in the Powder River Basin. CEGB Exploration, which has acquired the former

Cleveland-Cliffs Ruby Ranch property and the former Teton Exploration Leuenberger Ranch property, may produce uranium by solution mining methods at these sites in the Powder River Basin. Rio Algom acquired properties formerly owned by Kerr-McGee and is applying for a solution mine at the Bill Smith mine site in the Powder River Basin. Other companies have announced plans to study the feasibility of developing production by solution mining. Additionally, U.S. Energy-Crested Corporation is continuing to acquire permits for an underground uranium mine below Green Mountain, south of Jeffrey City.

Late in May, the Society of Mining Engineers sponsored a symposium on in situ solution mining. While the conference, which was held in Casper, was not limited to the solution mining of uranium, the majority of nearly 200 attendees were from the uranium industry. Solution mining methods for uranium, copper, gold, and other metals may offer a cost effective alternative to conventional underground or open pit mining. Many of the speakers at the conference elaborated on existing projects, solution mining techniques in general, and the economics of this kind of mining.

The coming independence of Namibia in southern Africa may increase uranium imports into the United States. Currently, Namibia, which is part of the Republic of South Africa, exports uranium to many countries from the Rossing mine, one of the world's largest. Exports to the United States are prohibited by the Comprehensive Anti-apartheid Act of 1986. However, Namibian independence may cause the U.S. Congress to reconsider the Anti-apartheid Act in regard to Namibia. If import sanctions are repealed, U.S. purchasers would be able to buy uranium oxide from RTZ, the operator of the Rossing mine.

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METALS & PRECIOUS STONES UPDATE

The Metals and Precious Stones Division of the State Geological Survey has nearly completed a final report on the South Pass mining district of Fremont County. A small scale regional map of this important gold district should be published during the next quarter. The final report, which is slated for publication before the end of the year, will include mine maps, many new geochemical analyses and assays, as well as other geologic information. Dan Hausel, the Division Head and field investigator on this project, indicates that the district has high potential for several placer and lode gold deposits, some potential for nickel and tungsten deposits, high potential for buried gold deposits, and the possibility for one or more very large gold deposits. Models for gold and nickel deposition are being developed for the area.

If you haven't seen it yet, the State Survey has published a new bulletin on the State's precious metal lode and placer deposits (Hausel, 1989). This 248-page report summarizes 10 years of field, library, and archive research by the author and includes more than two dozen illustrations and photographs of mining districts, mines, prospects, occurrences, and anomalies. There are descriptions and assay data for nearly 400 mines and prospects in about 50 districts or areas. Much of this information has not been previously accessible to the public sector.

The State Survey has begun its 1989 field survey for indicators of potentially diamond-bearing kimberlites. This ongoing project has already identified 150 heavy mineral anomalies that indicate possible kimberlite intrusives. In addition, samples collected from one million year old lamproites from the Green River Basin are being tested for diamond because of the similarity of these rocks to the diamondiferous rocks in the Kimberley Province of northwestern Australia. This latter effort has been considerably enhanced as a result of the Legislature's willingness to send the Head of the Metals and Precious Stones Division to Australia's Kimberley Province in 1987.

In the future, the State Survey hopes to expand this diamond project to include in-depth evaluations of the anomalies that it has found over the years. This expansion will involve detailed geologic mapping, geochemical studies of the pyrope garnet indicator minerals, and geophysical surveys.

On the national level, Senator Dale Bumpers (D.Ark) has submitted a bill to revise the 1872 Mining Law. Bumper's proposed revisions of the hard rock mining law are anything but minor. Some of the more significant changes proposed by Bumper's bill are an 8 percent royalty, increased diligence requirements to maintain claims, and no longer patenting the surface along with the mineral patent. These revisions could spell real trouble for independent prospectors with limited capital.

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Gary B. Glass
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Geological Survey of Wyoming

Agricultural Outlook

Optimism is the by-word for cattle and sheep producers across most of the west, despite the drought conditions experienced in many areas of the Dakotas, Idaho and Wyoming. Earlier concerns about a dry year in the major feed grain producing states did not materialize. The corn crop projected to exceed 7.3 billion bushels should be a full 50 percent higher than 1988's drought induced 4.8 billion bushels. This will result in lower grain prices and stronger prices for feeder cattle and lambs in the fall of 1989.

Wheat and other food grain prices are stronger than a year ago, and are projected to remain strong throughout the coming marketing year. This will be the third straight marketing year that world wheat production won't meet demand. A smaller U.S. spring wheat crop coupled with smaller U.S.S.R. and Canadian crops, have tightened overall world supply conditions.

GRAINS

The 1989 corn crop, currently estimated at 7.3 billion bushels, will offset sharply lower carryover stocks, and total supplies are expected to remain near year-earlier levels. Average yields were estimated by USDA at 112.8 bushels per acre, 6 bushels below the previous record set in 1987 but 28 bushels above a year ago. Use for livestock feed is expected to increase slightly during the 1989/90 marketing year and account for 45 percent of total disappearance. Another 20 percent of available supplies will go into export channels and a slightly smaller amount will be used for food, seed and industrial applications. This will leave ending stocks next August very close to the current marketing year, yet price levels are expected to range sharply lower.

Corn prices will likely fall below \$1.90 per bushel this fall, before starting to increase again in the months immediately following harvest. By December, corn prices will be trading above \$2 per bushel and possibly add another 20 cents by spring. USDA is forecasting slightly smaller corn exports during the 1989/90 marketing year due to larger global supplies and reduced imports from Russia. However, if exports fall below expectations, seasonal price gains may be more limited.

The wheat picture for 1989/90, whether viewed from a world or a U.S. perspective, looks tight. It appears that wheat prices will be at least 20-30 cents stronger than a year ago, at least through the first half of the marketing year. The potential downside may occur as we move into 1990 if feed grain prices remain low due to reduced

export demand, because of some potential for substitution of feed grains for wheat on the world market. This marginal substitution could keep downward pressure on wheat prices. Due to the reduced crop this summer, U.S. ending stocks for the 1989/90 marketing year are projected at 500 million bushels, down 60 percent from the 1,261 million bushels at the end of the 1988 marketing year.

LIVESTOCK

Retail beef price for the first 6 months of 1989 was almost 7 percent above a year earlier levels. If beef demand can continue to hold this strong, it will provide the opportunity for most of inflation to be bid into beef and cattle prices. Traditionally, strong prices such as what we have witnessed the past two years, occur near the build-up period of a cattle cycle, with strong prices carrying through the first 4-5 years of the build-up period.

Traditionally, cow-calf operators have expected to make an economic profit one or two years out of ten. Since 1987 this segment of the industry, for the most part, has been profitable. Now the questions echoed by most producers are: "How long will this market last? When will herd expansion begin? and How fast will herds expand?" Cattlemen not accustomed to long periods of strong prices, are concerned about the outlook. Especially since most analysts are predicting strong prices through at least 1991, and likely longer.

The 1989 USDA Midyear Cattle Inventory report did not strongly indicate the beginning of herd expansion in the United States. Herd size on July 1, 1989 projected at 108.6 million head was basically the same as estimated for 1988. Probably the strongest indicator of cattlemen's expansion intentions was the increase in heifers being held for beef cow replacements. These heifers numbered 5 million head, 4 percent more than a year ago. Beef cow numbers increased slightly, just enough to counter the decrease in dairy cow numbers. Even with the same size cow herd, the calf crop was slightly smaller than a year ago, which probably reflects effects from last year's drought on conception rates.

Perhaps most significantly, the midyear report indicates that after seven years the liquidation of the U.S. cattle herd has ceased. Indications are that 1989 will signal the beginning of the expansion of the cow herd, although at a much slower rate of expansion than

experienced in past expansion phases. Cattlemen have been slow to respond to higher prices due to larger debt service, increased costs, and forced marketings from reoccurring drought conditions.

Supplies of feeder cattle for the last half of 1989 appear to be about the same as a year ago at 44.2 million head. Yearling cattle, or those weighing over 500 pounds July 1, were estimated at 13.4 million head, 3 percent more than in 1988. These cattle will comprise most of the remainder of 1989's feedlot placements. Feeder cattle and

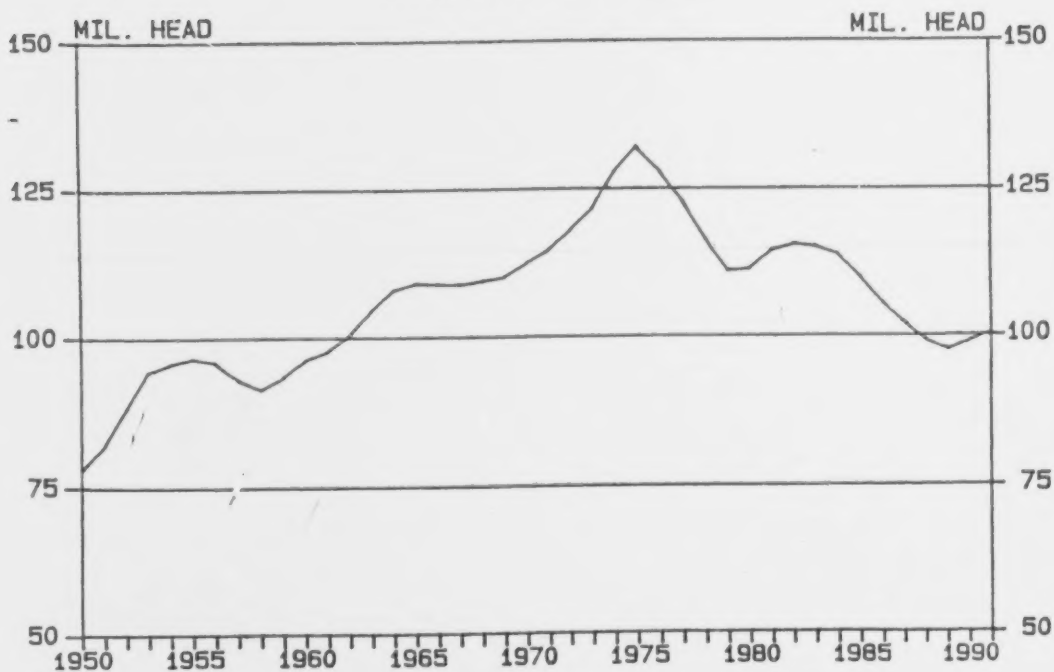
calf prices are expected to remain strong the remainder of this fall, winter and into next spring, since supplies of these cattle are expected to stay about the same as a year ago. Declining feedgrain prices and increasing fed cattle prices could add more strength to feeder cattle and calf prices in the months ahead.

Robert D. Carver
University of Wyoming

Table 1

JANUARY 1 CATTLE INVENTORY

U.S., FORECAST 1989-91



Western Livestock Marketing Information Project
Cooperative Extension Service

Data: CATLINV.CSV, Date: 08/10/88, Number: C-N-01

Job Openings Outlook

EMERGENCY MEDICAL TECHNICIANS

Emergency Medical Technicians (EMT's) give immediate care to critically injured or ill persons and transport them to hospitals. They determine the nature and extent of illness and injury and provide emergency medical care. There are three EMT levels: certified EMT I or EMT basic (ambulance), EMT II (intermediate) and EMT paramedic. An EMT I attendant is authorized to give emergency care, rescue and resuscitation service, provide emergency transportation and administer oxygen. EMT II attendant can give more extensive care to patients under a doctor's supervision and may administer certain specified drugs. An EMT paramedic attendant is authorized to perform all the emergency care of EMT I and II, plus perform under a physician's supervision by phone or radio contact extensive care as needed.

EMT's work both indoors and out. Some work rotating shifts such as 24 to 48 hours then off 24 to 48 hours. Work schedules may include holidays and weekends. Others work daily eight hour shifts, five days a week. The main employer in many smaller communities is the fire department. In this setting, fire fighting may be the primary duty with emergency care being secondary.

EMT's must complete an EMT course approved by the department of transportation and be certified on the state level. Voluntary certification is available through the national registry after state certification. Basic certification for all EMT's involves completion of 120 hours of course work and passing a written and practical exam given at the end of the course. Certification for EMT II and EMT paramedics involves affiliation with Wyoming ambulance service, physician recommendations, and completion of advanced course work beyond the 120 hours. Training consists of classroom instruction and additional on-the-job training. Certifications must be renewed every two years and EMT's must complete continuing medical education recertification requirements set by the 'Wyoming Emergency Medical Services Act of 1977'.

There is a shortage of EMT's in Wyoming. Employment depends on continued availability of training, openings created by expansion of emergency medical services, replacement of those who leave the field, and trained workers moving into the state. Sources indicate that there are more EMT I's trained each year than there are jobs. This creates a surplus of applicants with almost no experience. However, due to this occupation's high 'burn-out' rate, positions are usually filled as soon as there are openings. Although Wyoming is experiencing a surplus of EMT I's there remains a need for advanced EMT's. Since Wyoming has no paramedic training program, few EMT's interested in furthering their training to the paramedic level will stay. Turnover for EMT fire fighters is low because of excellent benefits and retirement. Overall employment for EMT's who are willing to

travel can be found in most of Wyoming's larger cities.

PHYSICIANS

Physicians try to stabilize and help improve their patients health. Most physicians diagnose medical ailments and prescribe medicine for treatment. They act as consultants, advising patients regarding proper diet and exercise. Physicians place an emphasis on medical procedures while routine tasks are assigned to auxiliary workers. Physicians may specialize in 34 major fields recognized by the American Medical Association.

Physicians must be able to work with people and communicate both in writing and orally. Good use of hands and fingers are useful. They need the ability to understand the complex medical sciences, have good judgement, and make decisions in emergency situation as required.

Physicians usually work in private offices, walk-in clinics and hospitals. Few house calls are being made because modern medical equipment is available at hospitals and offices. Physicians' workweek is often irregular and averages 60 hours. Older physicians often practice part-time.

Physicians must be licensed by the State Board of Medical Examiners to practice. Licensing requirements include: completion of a 4-year doctor of medicine program at an approved medical school, one-year post-graduate training, and passing an oral licensing exam. Length of residency of those who specialize is usually longer than one year.

Earnings vary and depend on factors such as experience, skill, professional reputation, patients' income, geographic location, office expenses, and overhead. Physicians in private practice generally earn more than salaried physicians, and specialists usually earn more than general practitioners. After residency is completed, average earnings range between \$30,000-60,000/year. The American Medical Association reports that the national average is about \$100,000/year.

Generally, there is a balance of physicians in most areas. Wyoming is experiencing a shortage of some specialty physicians at this time, particularly in rural areas of the state. Outlook is good, especially for those who are willing to reside in Wyoming's smaller communities and accept a lower income. Needs in these communities is essentially limited to family physicians, general interns, and general practitioners. Many physicians who are part of the Wyoming Contract Program are required to repay their training with in-state practice.

Suzanne McGuire
Research Assistant, WCIS

**FEATURE
ARTICLES**

"The Importance of Public Health in Rural Wyoming"

The great British statesman Benjamin Disraeli once said, "The health of the people is really the foundation upon which all their happiness and all their powers as a state depend."

Good health is a dynamic state of mind, body and spirit, to be pursued by the individual, the community and the state.

The mission of the Division of Health and Medical Services is to preserve and enhance the health of the people of Wyoming and to assure conditions in which people can be healthy.

However, rising health care costs and dwindling resources require new approaches, innovative planning, creative methods and new initiatives to assure citizens that access to health care will be available to them at a time when the demand for those services is increasing.

A critical strategy in trying to balance those limited resources in the rural areas of Wyoming and maintaining an acceptable level of public health services is through the emphasis on preventive medicine.

By providing ongoing health education, keeping the citizens of the state aware that much of today's illness is related to lifestyles we hope to reduce premature death and disability.

While keeping our citizens healthy is our primary objective, an important benefit of preventive medicine is also the cost factor in terms of medical cost savings.

For example,

- for every \$1 spent in prenatal care, \$3.38 is saved in medical care for the first year of life;
- for every \$1 spent in prenatal care, \$11 is saved in lifetime costs;
- for every \$1 spent in pertussis immunization, \$5.70 is saved in medical care;
- for every \$1 spent in smoking cessation programs, \$21.01 is saved in lifetime costs.

The Division spent \$1.1 million to care for two premature infants born to 16 year old mothers. The chances of those infants requiring ongoing

expensive medical care throughout their lives are very high.

The outbreak of measles at the University of Wyoming in 1986 resulted in the need to investigate the outbreak and to immunize susceptible students for a total cost of \$200,000. If the five infected students had been immunized prior to college, the cost would have been \$50.

In 1985, 14% of Wyoming mortality was attributed to smoking for a cost of \$27 million in medical care.

The importance of preventive medicine in public health becomes more critical when we are confronted with population changes, with changes in life styles that affect health and employment status and to changes in disease indices.

The AIDS epidemic has already had a devastating financial impact on other parts of the nation. While Wyoming has a current low rate of incidence with only 33 reported cases and 17 deaths, we must anticipate that this will change in the future.

With a significant increase in our aging population we must examine new approaches to our care for the elderly. Public health nursing has begun to anticipate these needs by providing nursing care in the home. This helps keep 260 elderly patients out of nursing homes longer, thus saving Medicaid \$1 million a year in the process.

It is estimated that if 25% of 1,123 home health patients were kept out of nursing homes for one additional year it would mean that 281 individuals at an average daily patient charge of \$45.42 could result in a savings of \$4,658,495.

Public health in Wyoming extends into many other areas not usually identified as such in the minds of the citizens impacted by their programs and services.

For example, emergency medical services centers around the proper management and care of the patient from the moment of injury through the recovery period.

Environmental health services works to assure sanitary conditions in the restaurants we patronize, public swimming pools and spas, and child care facilities to prevent food or water borne diseases.

The immunization program has been successful in preventing the occurrence and transmission of vaccine preventable diseases. While other parts of the country are experiencing measles epidemics, Wyoming remains at low risk, having had only two cases in the past four years.

Radiological health services reduces or eliminates unnecessary radiation exposure to the general public and radiation workers and serves as an information source regarding radon which is a significant public health hazard.

The basic, long-term objective of the family health services component of public health is to improve the health of families in Wyoming through health education, prenatal care, infant and child care, nutrition and adolescent health. The Federally funded Women, Infants and Children (WIC) program is a nutrition intervention program for pregnant, postpartum and breastfeeding women, infants and children under the age of 5 who are at nutritional and health risk.

The dental health program and medical assistance services (Medicaid) also have significant impact in the provision of health care in the state.

The Division of Health and Medical Services is operating with a biennial budget of \$133.4 million.

While this may seem a significant amount, it is important to note that the WIC and Medicaid programs alone account for \$111 million of the total.

Based on a population of 492,178 Wyoming's public health expenditures currently amount to \$22.76 per capita, without WIC and Medicaid. However, the need for public health services continues to outgrow the resources available to provide them.

There can be no doubt that if we are to continue to meet our objectives of protecting the health and safety of the citizens of Wyoming public health will play an increasingly more important role. We must continue to serve the public interest by involving key policymakers and the general public in determining personal and communitywide health services.

Keeping the public informed about how to obtain public health, and how to comply with public health requirements is a challenge we are ready and willing to accept.

Helen Levine
Public Information Officer
Division of Health and Medical Services

The Effects of Malpractice in Wyoming and Possible Solutions

Health care in Wyoming and across the nation today offers methods of treatment and technologies never before available in helping to improve and prolong the quality of life for our residents. At the same time, however, a number of factors affecting the cost of that health care have restricted its availability in many of Wyoming's small communities and threatened some basic health care services.

In large part, the reason for this problem lies in the rapid increase in professional liability insurance rates for physicians over the past decade. A report prepared by the American Medical Association's National Medical Society Coordination Project on Professional Liability explains that changes in the affordability of medical liability insurance have affected the medical profession in two ways. First, the cost of insurance has increased significantly for all physicians. And for some physicians, such as obstetricians, the increases have raised a serious concern about obtaining insurance at all. Secondly, the nature of insurance coverage has changed dramatically and physicians have increased the amount of risk they must assume directly.

The most serious result of these changes is one with which Wyoming residents have become increasingly familiar -- the problem of reduced access to some types of health care. For certain specialties which are inherently risky, such as obstetrics, patients are finding fewer, and in some cases, no physicians willing to perform those services. It is estimated that by 1987, twelve percent of the nation's obstetricians had stopped delivering babies. Between 1987 and 1988, nearly one-half of Wyoming physicians performing deliveries dropped their obstetrical insurance coverage.

A look at the current medical liability premium rates charged Wyoming physicians by the state's leading malpractice insurer shows quite clearly the problems facing Wyoming physicians who deliver babies. The mature rate for a practicing obstetrician-gynecologist is \$38,803 per year. Those gynecologists who no longer perform deliveries pay an annual rate of \$19,206. Family practitioners who include deliveries in their services face an annual premium of \$21,504 compared to a rate of \$6,813 for a family practitioner without obstetrical coverage. Given the relatively few number of deliveries performed in smaller communities, coupled with the general decline in Wyoming's economy, it is hardly surprising that physicians can no longer afford to pay the high

insurance premiums required to continue obstetrical services.

A second, but no less serious result is the impact of the increased risk of medical malpractice claims on the overall cost of health care. While the cost of medical services is directly increased by increases in physician insurance costs, it is also indirectly increased by billions of dollars in defensive medical practices designed to protect against a liability claim. The American Medical Association estimates these costs to exceed \$12 billion, and further estimates that between 30% and 40% of physician-ordered tests are defensive in nature. Defensive medical practices, such as increased diagnostic tests, increased visits and more detailed record-keeping, provide minimal assistance to the physicians's clinical judgement, but do protect the physician in the event his clinical judgement comes under scrutiny in malpractice litigation.

In fact, the fear of malpractice suits is leading some doctors to turn away high-risk patients. According to a recent Gallup poll, reported in the July 6, 1989, *Journal of Commerce*, "35% said there are forms of medicine they do not practice, despite being qualified, because of high liability insurance costs."

The effect of these problems on medical care in Wyoming is easily seen. The cost of medical care for all residents has increased due to increases in liability premiums and the emphasis on defensive medical techniques. The more visible, and potentially more dangerous, effect is the loss of or reduction in obstetrical and other medical services in many of our communities.

What can be done to resolve this problem? The discussion on possible solutions covers wide and extremely varied viewpoints. A number of alternatives were discussed during the 1989 Legislative session. One unsuccessful measure, H.B. 119, offered a solution for funding based on a program in use in the state of Hawaii. This bill would have provided an appropriation to the Division of Health and Medical Services to provide obstetrical services to areas of the state where those services were determined to no longer be available. An offshoot of this legislation was the authorization of a trial program allowing the Governor to enter into joint cost-sharing agreements with county governments on a matching basis to, in part, offset the obstetrical portion of malpractice premiums for physicians. To date three counties, Niobrara, Converse and Fremont,

have sought and been granted emergency funding from the Governor's contingency fund.

These efforts, while commendable, are at best stop-gap measures designed to address the immediate situation in our state, which do little to insure future protection from similar circumstances. A growing body of evidence from other states increasingly suggests the most effective solution to bring down insurance rates, thus ensuring quality, affordable care for our residents, is to make some modifications in the present legal system under which malpractice and liability claims are handled.

A statement by the Executive Council of the AFL-CIO offered these comments on how the current tort system contributes to the cost of insurance: making liability exposures more predictable and liability insurance more affordable. Leveling the playing field can result, as it has in a growing number of other states in lower premiums for Wyoming doctors and continued high quality medical care for Wyoming's residents.

"Liability insurance can be made available at affordable rates only if it is possible for an insurer to predict, on an actuarial basis, the losses that are likely to be incurred, and only if those losses are not excessive when compared to the value of the underlying activity. If risks defy measurement or prediction, or if the predictable losses are increasing, the price of insurance rises accordingly."

Clearly, the ability to accurately predict losses is important in the rate determinations of insurers. And many states, including some of those neighboring Wyoming, have found that successful "tort reform" measures have helped bring down insurance rates.

In Nevada, most physicians will see a cut or freeze in their professional liability premiums this year due to a state screening panel that insurers say is keeping frivolous malpractice claims out of the court system. As a direct result of the success of that program, Nevada's primary insurer will reduce its rates by 11.4% across the board for the nearly 70% of Nevada physicians it insures. Two other insurance companies plan to either freeze their rates or offer a reduction. The Medical Legal Screening Panel, comprised of three physicians and three attorneys, found in 1988, that 110 of the 117 claims reviewed by the panel prior to trial had no merit.

In Maryland, the state's largest medical malpractice insurer announced earlier this year it will not seek a rate increase for physicians for the third consecutive year. The company cited recent changes in Maryland's tort law -- including a law requiring patients to obtain a certificate of merit before suing their doctors and a cap on noneconomic damages -- as helping to keep rates steady.

Colorado physicians will also see benefits from tort reform legislation that went into effect in that state on July 1. In 1990 COPIC, a Colorado doctor-owned company, will not raise its annual rates -- the first time in five years that rates have not increased. Not only have premium rates been affected by tort reform measures, but the number of claims filed has also dropped in some states. Medical malpractice filings in Connecticut have dropped by 30 percent from an all-time high in the mid-1980's. Statistics show the drop coincided with the Legislature's 1986 and 1987 adoption of tort reform initiatives, designed to reduce excessive attorney's fees and weed out frivolous claims.

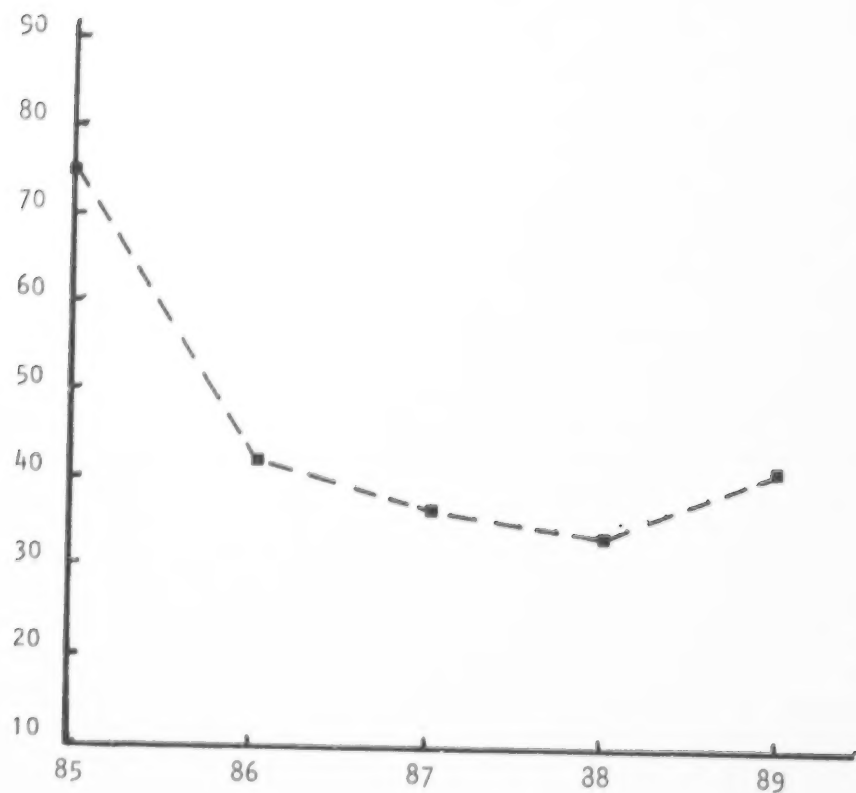
The medical profession and others who advocate modifications in the tort system do not seek to take away the victims' ability to recover full economic damages and significant damages for pain and suffering. The changes being sought are merely to eliminate the arbitrariness in recoveries and to bring a measure of stability, objectivity and certainty to the pricing and availability of insurance.

Tort reform cannot be tossed out as the cure for all the health care access, cost and availability problems found in Wyoming today. The questions surrounding these issues are complex and multi-faceted. But as physicians and citizens begin to see more and more evidence that tort reform measures may lead to overall reductions in health care and a stabilization of the number and size of malpractice claims being filed, it becomes apparent that tort reform measures are among the possible solutions to Wyoming's present problems.

Thoughtful, balanced consideration of the most effective tort reform measures may provide some answers to Wyoming's health care needs.

Wendy P. Curran
Government Relations
Communications Consultant
Wyoming Medical Society

Number of Physicians Leaving Wyoming 85-89



Compiled from renewal records of physicians as of 8/3/89
Source: State Boards of Medical Examiners

**ECONOMIC
CHANGES**

ECONOMIC CHANGES

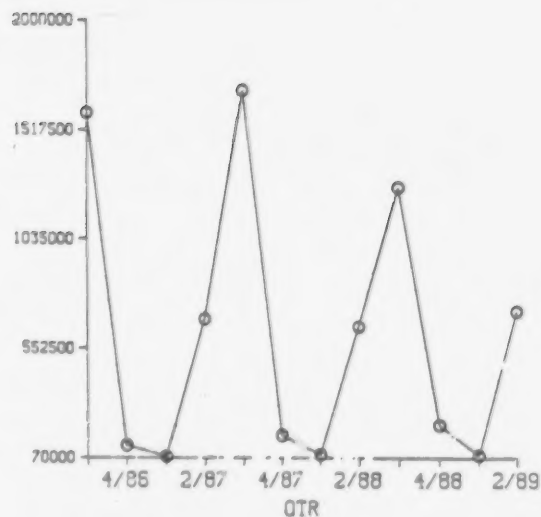
This section points out areas of Wyoming's economy in which noteworthy changes or trends appear.

Since the end of the second quarter marks the beginning of an increase in tourism, a look at the number of monthly visitors to some of Wyoming's hot spots is of interest.

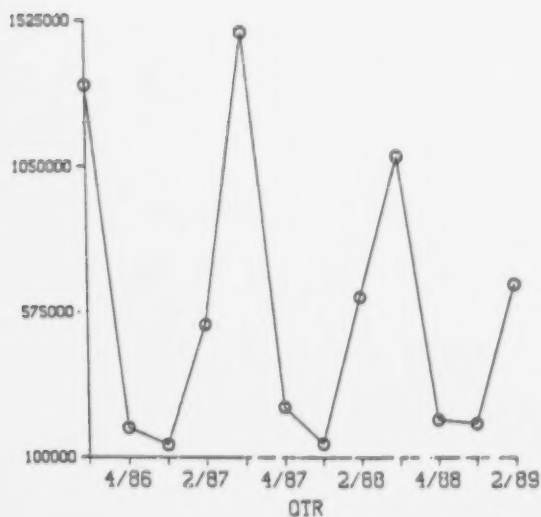
Presented here are representations of the number of visitors to Yellowstone National Park, Grand Teton National Park and Devils Tower. Information for these graphs is received monthly from the National Park Service.

While the seasonal swings in park attendance is not surprising it is interesting to note that the Yellowstone fires of '88 seem to have had no negative effect on Park visitations. In fact the 720,021 visitors to Yellowstone in the second quarter of 1989 is an increase over the 649,842 in the same quarter last year. This same trend can be seen in the number of visitors to Grand Teton National Park and Devils Tower.

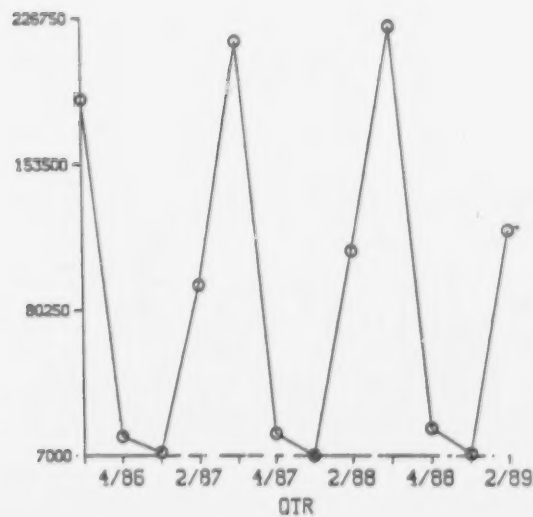
YELLOWSTONE



GRAND TETON



DEVIL'S TOWER



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Table 1: Agriculture¹

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. Timber Cut in Wyoming National Forests (MBF)	10867.	42510.	47783.	25572.	20299.	75482.	28080.	5860.	39416.	54863.	23488.	6218.
Price Indices ² (1967=100)												
2. Wyoming Crops, Prices Received-Latest	216.	208.	204.	209.	229.	218.	218.	236.	319.	310.	336.	336.
3. Wyoming Crops, Prices Received-Average	219.	215.	206.	207.	230.	218.	217.	221.	303.	312.	325.	335.
4. U.S. Crops, Prices Received-Latest	187.	190.	192.	210.	266.	216.	212.	249.	265.	261.	264.	263.
5. U.S. Crops, Prices Received-Average	195.	191.	192.	203.	223.	217.	214.	228.	263.	259.	265.	269.
6. Wyoming, All Commodities, Prices Received-Latest	248.	235.	261.	263.	304.	268.	301.	275.	301.	294.	314.	297.
7. Wyoming, All Commodities, Prices Received-Average	241.	241.	260.	268.	283.	273.	294.	288.	283.	304.	308.	305.
8. U.S. All Commodities, Prices Received-Latest	223.	220.	222.	237.	235.	232.	237.	253.	265.	265.	272.	267.
9. U.S., All Commodities, Prices Received-Average	227.	223.	222.	233.	234.	235.	238.	245.	263.	263.	270.	250.
10. Wyoming Livestock, Prices Received-Latest	257.	242.	278.	280.	327.	283.	325.	287.	295.	289.	307.	286.
11. Wyoming Livestock, Prices Received-Average	247.	248.	276.	286.	300.	289.	317.	308.	277.	301.	303.	296.
12. U.S. Livestock, Prices Received-Latest	256.	247.	249.	261.	201.	248.	260.	258.	267.	269.	281.	272.
13. U.S. Livestock, Prices Received-Average	255.	251.	250.	242.	241.	252.	259.	261.	264.	267.	277.	273.
14. Prices Paid by U.S. Farmers-Average	324.	321.	327.	331.	336.	335.	339.	348.	352.	354.	359.	361.

¹First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.

²The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics.

Table 2: Banking and Finance

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. Total Bank Loans and Leases Financing Receivables (T\$)	2066324.	2003375.	1932753.	1931400.	1779168.	1765203.	1733754.	1787542.	1777474.	1758410.	1740029.	INA
2. Total Bank Deposits (T\$)	3787785.	3912276.	3741328.	3740737.	3688191.	3792473.	3671572.	3705311.	3712403.	3753325.	3623495.	INA
3. Total Non-Interest-Bearing Deposits (T\$)	611410.	638317.	559803.	591011.	582741.	603809.	531243.	564608.	572367.	577610.	525702.	INA
4. Savings and Loan Mortgage Loans (T\$) ¹	811230.	787910.	810354.	812614.	794162.	772721.	744492.	740954.	726300.	711602.	719240.	479751.
5. Savings and Loan Deposits (T\$)	1137155.	1148406.	1120110.	1104107.	1104332.	1137196.	1119558.	1107268.	1107961.	1070072.	1032814.	664769.
6. Prime Interest Rate ²	7.50	7.50	7.50	8.25	8.70	8.75	8.50	9.00	10.00	10.50	11.50	INA

¹Only members of the Federal Home Loan Bank Board are included. Indicates amount at the end of the quarter.

²Prime rate charged by banks on short-term business loans. Rate is for last month of the quarter.

Sources: Series 1-3: Office of the State Examiner of Wyoming, Abstract Report of State and National Banks in Wyoming, Published Quarterly.
 Series 4 and 5: Federal Home Loan Bank of Seattle, Monthly Report. Comparative statistical analysis of member institutions.
 Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 3: Business Conditions

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. New Domestic Corporations	262.	307.	256.	270.	267.	254.	300.	298.	246.	221.	274.	302.
2. New Foreign Corporations	189.	217.	206.	232.	259.	229.	208.	196.	208.	232.	210.	249.
3. Total New Corporations	451.	524.	462.	502.	526.	483.	508.	494.	454.	453.	484.	551.
4. Business Failures	89.	64.	47.	72.	56.	53.	75.	52.	34.	32.	31.	30.
5. Value of Business Failures (\$)	7242872.	12405831.	2935220.	5896578.	5918282.	14181020.	11499022.	3906790.	28339514.	36551338.	3120102.	7852143.
6. Personal Bankruptcies	288.	340.	333.	359.	301.	308.	271.	351.	306.	306.	274.	336.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.

Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 4: Construction

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. New Residential Dwelling Units	494.	317.	270.	458.	744.	297.	304.	449.	339.	292.	233.	294.
2. Value of Residential Dwellings Constructed (M\$)	33.0	21.6	17.6	34.2	59.4	34.3	23.5	37.3	28.8	22.9	18.3	25.1
3. Value of Nonresidential Construction (M\$)	51.3	9.2	6.8	39.7	23.0	18.2	4.2	35.2	7.0	10.2	11.0	16.1
4. Building Permits Issued in Selected Wyoming Cities	3698.	2112.	1015.	2841.	3953.	2451.	1489.	2763.	2220.	2082.	1578.	2806.
5. Value of Authorized Construction (T\$)	38669.	20453.	9083.	23444.	24258.	13633.	15559.	25330.	21878.	18071.	8866.	24528.
6. Mortgage Interest Rate ¹	9.74	9.43	8.77	9.05	9.03	8.78	8.77	8.72	8.90	9.03	9.66	

¹Conventional first mortgage for new home purchase. U. S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Local Construction Potentials." Published monthly.

Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.

Series 6: U. S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 5: Consumers

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. New Truck Registrations	3951.	2993.	2253.	3155.	3011.	3391.	2867.	3508.	3203.	3227.	3086.	3734.
2. New Car Registrations	4181.	2784.	2211.	3171.	3332.	3027.	2736.	3147.	2969.	2849.	2538.	3341.
3. Wyoming Personal Income (M\$)	6277.	6127.	6108.	6288.	6235.	6287.	6261.	6524.	6453.	6584.	INA	INA
4. U.S. Disposable Income (B\$)	3038.	3062.	3126.	3147.	3225.	3316.	3376.	3421.	3507.	3564.	3696.	2478.
5. U.S. Personal Income (M\$)	3537997.	3590393.	3664374.	3722315.	3786079.	3902016.	3922767.	3995275.	4077502.	4172895.	INA	INA
6. Latest U.S. Consumer Price Index (1982-1984=100) ¹	324.9	325.7	111.0 ²	112.4	113.8	114.2	115.1	116.7	118.5	119.2	120.0	122.5
7. Quarter's Average U.S. CPI	327.1	325.6	110.5 ²	112.0	113.3	114.2	114.8	116.7	117.8	119.5	120.2	81.4
8. Liquor Sales (T\$)	8334.	8811.	5421.	6673.	7616.	8379.	5679.	6714.	7041.	8368.	5530.	6747.

¹Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers.

²Beginning January 1987, the consumer price index, previously expressed on a base of 1967=100, has been rebased to 1982-84=100. Selection of the 1982-84 period was made to coincide with the updated expenditure weights, which are based upon data tabulated from the Consumer Expenditure Surveys for 1982, 1983, and 1984. Historical data on the new base or additional information regarding these changes is available from the Bureau of Labor Statistics, Washington, D.C. 20212.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
 Series 3,4: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published quarterly.
 Series 5,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
 Series 8: Wyoming Liquor Commission. Sales data are reported to SRC.

Table 6: Employment and Labor¹

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. Civilian Labor Force	255514.	243637.	238819.	248444.	242054.	230684.	228734.	233949.	235003.	232159.	226172.	225615.
2. Employment	235065.	221405.	209316.	226738.	225635.	214312.	209923.	220780.	223829.	216417.	208738.	212474.
3. Unemployment	20449.	22233.	29503.	21707.	16419.	16371.	18811.	13168.	11174.	15741.	17434.	13141.
4. Unemployment Rate	8.0	9.1	12.4	8.7	6.8	7.1	8.2	5.6	4.8	6.8	7.7	5.8
5. Initial Claims Filed	11710.	14560.	13392.	8086.	6386.	9983.	10949.	6888.	5376.	9709.	10334.	6508.
6. Applications Received	13057.	10542.	10013.	11276.	9067.	9470.	INA	INA	INA	INA	INA	INA
7. New Non-Agricultural Openings	10997.	7408.	4872.	9615.	9532.	8342.	INA	INA	INA	INA	INA	INA
8. New Non-Agricultural Placements	8869.	7149.	4182.	8020.	7117.	8061.	INA	INA	INA	INA	INA	INA
9. Miners' Average Weekly Hours	42.0	42.7	40.9	40.8	42.7	45.4	42.9	44.1	43.7	43.1	46.3	42.7
10. Miners' Average Weekly Pay (\$)	609.39	627.13	599.03	602.91	605.87	637.42	625.72	649.91	640.19	650.14	678.68	612.15
11. Miners' Average Hourly Wage (\$)	14.51	14.68	14.66	14.79	14.19	14.04	14.60	14.75	14.65	15.07	14.67	14.34

¹The most recent year's data are preliminary.

Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published monthly.

Table 7: Energy and Mineral Production

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. Wyoming Coal (TST)	34406.	36350.	35184.	33887.	39261.	38831.	37323.	40802.	41355.	42257.	39086.	40814.
2. U.S. Coal (TST)	215298.	222291.	222892.	219022.	226784.	246314.	231473.	230464.	241952.	258662.	241903.	238674.
3. Wyoming Oil (TBPB)	327.	317.	310.	302.	310.	317.	320.	302.	309.	310.	309.	302.
4. U.S. Oil (TBPB)	8505.	8390.	8371.	8339.	8227.	8347.	8304.	8301.	8185.	8073.	7900.	7860.
5. Wyoming Natural Gas (MMCFD) ¹	888.	1692.	1453.	1281.	1171.	1203.	1430.	1334.	1135.	INA	INA	INA
6. U.S. Natural Gas (MMCFD)	43457.	46953.	50801.	45830.	44335.	49241.	50768.	46453.	44547.	49358.	INA	INA
7. Active Rig Counts in Wyoming-Average	22.	38.	23.	27.	47.	61.	40.	33.	43.	31.	20.	22.

¹Beginning with fourth quarter 1986, Wyoming gas includes carbon dioxide production.

Sources: Series 1,2,5, and 6: U. S. Department of Energy. Energy Data Reports. Gas data are from Natural Gas Monthly, and the Wyoming Oil & Gas Conservation Commission. Coal data are published weekly.
 Series 3-4: The Oil and Gas Journal. U.S. and Wyoming Oil Production. Published weekly.
 Series 7: Petroleum Information Corporation, Hughes Tool Company. Monthly Average Active Rig Counts in Wyoming.

Table 8: Government

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. Sales and Use Tax Collections (T\$)	55716.	51058.	39867.	39591.	44922.	47115.	42585.	42769.	49721.	46445.	41823.	42966.
2. Violent Crime ¹	374.	269.	299.	325.	435.	354.	354.	371.	431.	308.	310.	INA
3. Nonviolent Crime ²	5265.	4294.	3955.	4772.	5057.	4420.	3713.	4562.	4662.	3917.	3565.	INA
4. Stolen Property (T\$)	2420.	2222.	1880.	2342.	2494.	2199.	1770.	1986.	2467.	2272.	2040.	INA
5. Stolen Property Recovery Rate	38.6	31.0	41.4	35.7	33.1	34.1	42.2	43.1	35.5	36.0	42.8	INA
6. Percent of Crimes Cleared ³	25.2	36.4	32.0	26.6	44.2	34.5	33.7	28.3	30.9	40.0	33.0	INA

¹ Murder, negligent homicide, forcible rape, robbery, aggravated assault.

² Burglary, larceny, auto theft.

³ Clearance of a crime indicates resolution of a complaint by arrest or other extraordinary means.

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and Use Tax Division. "Net Collections by Business Class by County." Published monthly.

Series 2-6: Uniform Crime Reporting Center for Criminal Justice Research, Division of Criminal Identification, Office of the State Attorney General. "Crime in Wyoming." Published quarterly.

Table 9: Tourism

<u>Calendar Quarters</u>	<u>3/86</u>	<u>4/87</u>	<u>1/87</u>	<u>2/87</u>	<u>3/87</u>	<u>4/87</u>	<u>1/88</u>	<u>2/88</u>	<u>3/88</u>	<u>4/88</u>	<u>1/89</u>	<u>2/89</u>
<u>Visitors, National Parks and Monuments</u>												
1. Yellowstone	1593749.	124314.	75835.	681163.	1692818.	168613.	83736.	649842.	1268270.	216076.	82542.	720021.
2. Grand Teton	1314373.	196051.	141570.	535659.	1486479.	264932.	144982.	624400.	1083754.	223562.	211180.	665734.
3. Devil's Tower	186134.	16610.	8523.	92700.	215299.	17980.	7121.	109993.	222877.	20702.	8064.	120589.
4. Fossil Butte	10105.	1152.	282.	5082.	13793.	1072.	286.	5894.	13838.	1195.	224.	5565.
5. Fort Laramie	52465.	3863.	1305.	35117.	50167.	4437.	1172.	24384.	49631.	4145.	1475.	20488.
6. Big Horn NRA-South ¹	65696.	40878.	22056.	55064.	70305.	40782.	30045.	60727.	58820.	35558.	14293.	47417.
<u>Other Tourism Indicators</u>												
7. Traffic Count (Avg. number of Vehicles/Day)	147829.	91685.	78349.	116920.	163546.	113385.	88529.	142830.	178675.	118023.	113409.	146663.
8. Hotel, Motel, and Camp Sales Tax (T\$)	2205.	1364.	928.	891.	1821.	1871.	947.	1050.	2106.	1929.	954.	1013.
9. Gasoline Sales (TGL)	95902.	68488.	56561.	79620.	98146.	71190.	62295.	81811.	96106.	70784.	61807.	45692.

¹ Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
 Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
 Series 8: Wyoming Department of Revenue and Taxation. "Sales and Use Tax Summary by County by SIC Major and Minor." Reported monthly.
 Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 10: Utilities¹

Calendar Quarters	3/86	4/86	1/87	2/87	3/87	4/87	1/88	2/88	3/88	4/88	1/89	2/89
1. Residential Electric Connections	177718.	177613.	177091.	176113.	175745.	175879.	175896.	176333.	177122.	176457.	175841.	175589.
2. Residential Electric Consumption (TKWH)	300186.	408558.	476965.	337943.	291941.	399068.	505669.	351036.	301098.	401776.	688891.	348577.
3. Commercial Electric Connections	33786.	33880.	33355.	33744.	33898.	33780.	33602.	33722.	33846.	33756.	33928.	33997.
4. Commercial Electric Consumption (TKWH)	418211.	486495.	438712.	403123.	419465.	416675.	456190.	420630.	425495.	426766.	467697.	414902.
5. Industrial Electric Connections	2884.	2655.	2989.	2791.	2796.	2764.	2760.	2748.	2921.	2872.	2972.	3104.
6. Industrial Electric Consumption (TKWH)	1452583.	1708946.	1718924.	1587866.	1740306.	1819191.	1788103.	1815370.	1720051.	1847617.	1812799.	1923513.
7. Other Connections ²	3317.	3030.	2801.	3201.	3195.	2680.	2965.	3690.	3899.	3404.	3349.	7440.
8. Other Consumption (TKWH)	66445.	55088.	47998.	51328.	84447.	16355.	10451.	24283.	64994.	13221.	9051.	41364.
9. Residential Natural Gas Connections	74548.	75188.	75206.	74384.	73512.	72654.	74286.	73935.	90673. ³	93300.	100074.	99535.
10. Residential Natural Gas Consumption (MCF)	1013300.	2661644.	3840399.	1944656.	740699.	2274494.	4310738.	2042533.	826220. ³	2521850.	5786697.	2436947.
11. Commercial Natural Gas Connections	6545.	6623.	6652.	6617.	6546.	6520.	6643.	6560.	8357. ³	9398.	9422.	9289.
12. Commercial Natural Gas Consumption (MCF)	398174.	1125927.	1687452.	939284.	408459.	997247.	1939461.	957241.	475106. ³	1349515.	2981071.	1283967.
13. Industrial Natural Gas Connections	91.	95.	98.	93.	88.	87.	88.	90.	90.	78.	85.	82.
14. Industrial Natural Gas Consumption (MCF)	1309870.	1770920.	1129556.	601308.	508551.	828532.	3249154.	482088.	2324709.	2504087.	3069267.	1977830.
15. Other Natural Gas Connections	38.	37.	37.	37.	38.	101.	39.	36.	35.	34.	36.	36.
16. Other Natural Gas Consumption (MCF)	5478.	132.	170.	1225.	7352.	6988.	12922.	1920.	7488.	232.	1216.	4344.

¹Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

²"Other" includes agriculture, municipal, and other public.

³Starting with third quarter, 1988, the figures for Residential and Commercial Natural Gas Connections and Residential and Commercial Natural Gas Consumption reflect the merger of Northern Gas Division, Northern Utilities Division, and Northern Mountain Gas Company now doing business as Northern Gas of Wyoming.

Sources: Series 1-16: Reports to SRC by selected electric and natural gas utility companies. Survey conducted monthly.

FORMAT

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 3rd quarter of 1986, and end with the 2nd quarter of 1989. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Quarters are calendar quarters. For example, the 4th quarter is composed of October, November and December. In the table headings and narratives, a particular quarter will be indicated by notation such as 3/86 (3rd quarter, 1986), 4/86 (4th quarter, 1986), and so on.

Beside each data series name is an abbreviation in parenthesis. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the State unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronym "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from SRC. A list of sources follows the footnotes.

Key to Units Abbreviations

MBF - Thousand Board feet

CWT - Hundred Weight

KWH - Kilowatt Hours

ST - Short Tons

TKWH - Thousand Kilowatt Hours

HST - Hundreds of Short Tons

\$ - Dollars

TST - Thousands of Short Tons

H\$ - Hundreds of Dollars

\$/ST - Dollars Per Short Ton

T\$ - Thousands of Dollars

HBBL - Hundreds of Barrels

M\$ - Millions of Dollars

TBPD - Thousands of Barrels Per Day

B\$ - Billions of Dollars

MCF - Thousands of Cubic Feet

GL - Gallons

HMCF - Hundreds of MCF Per Day

TGL - Thousands of Gallons

MMCFD - Million Cubic Feet Per Day